# ENVIRONMENTAL IMPACT REPORT

**Final –19 May 2023**

## THE PROPOSED JERSEY SOLAR POWER PLANT NEAR VENTERSDORP, NORTH WEST PROVINCE

ENVIRONAMICS

# PROJECT DETAIL

| | | |
|---|---|---|
| **DFFE Reference No.** | : | 14/12/16/3/3/2/2257 |
| **Project Title** | : | Proposed Jersey Solar Power Plant near Ventersdorp, North West Province |
| **Authors** | : | Mrs. Lisa de Lange (Opperman)<br>Ms. Christia van Dyk |
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| **Client** | : | Jersey Solar Power Plant (RF) (Pty) Ltd. |
| **Report Status** | : | Final Environmental Impact Report |
| **Submission date** | : | 19 May 2023 |

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# GLOSSARY OF TERMS AND ACRONYMS

| | |
|---|---|
| BA | Basic Assessment |
| BAR | Basic Assessment Report |
| CEA | Cumulative Effects Assessment |
| DFFE | Department of Forestry, Fisheries and Environmental Affairs |
| DM | District Municipality |
| DMRE | Department of Mineral Resources and Energy |
| DWS | Department of Water and Sanitation |
| EA | Environmental Authorisation |
| EAP | Environmental Assessment Practitioner |
| EIA | Environmental Impact Assessment |
| EMPr | Environmental Management Programme |
| EP | Equator Principles |
| EPFI | Equator Principles Financial Institutions |
| Environmental impact | Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects. |
| GNR | Government Notice Regulation |
| I&AP | Interested and Affected Party |
| IDP | Integrated Development Plan |
| IFC | International Finance Corporation |
| IPP | Independent Power Producer |
| kV | Kilo Volt |
| LM | Local Municipality |
| Mitigate | Activities designed to compensate for unavoidable environmental damage. |
| MW | Megawatt |

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| NEMA | National Environmental Management Act No. 107 of 1998 |
| NERSA | National Energy Regulator of South Africa |
| NWA | National Water Act No. 36 of 1998 |
| PPP | Public Participation Process |
| PV | Photovoltaic |
| REIPPP | Renewable Energy IPP Procurement Process |
| SAHRA | South African Heritage Resources Agency |
| SDF | Spatial Development Framework |
| SPP | Solar Power Plant |
| VU | Vegetation Unit |

## CONTEXT FOR THE DEVELOPMENT

According to Eskom, the demand for electricity in South Africa has been growing at approximately 3% per annum. This growing demand, fueled by increasing economic growth and social development, is placing increasing pressure on South Africa's existing power generation capacity. Coupled with this, is the growing awareness of environmentally responsible development, the impacts of climate change and the need for sustainable development. The use of renewable energy technologies, as one of a mix of technologies needed to meet future energy consumption requirements is being investigated as part of the national Department of Mineral Resources and Energy's (DMRE) (previously referred to as the Department of Energy) long-term strategic planning and research process.

The primary rationale for the proposed solar photovoltaic (PV) facility is to add new generation capacity from renewable energy to the national electricity mix and to aid in achieving the goal of 42% share of all new installed generating capacity being derived from renewable energy forms, as targeted by DMRE (Integrated Resource Plan Update 2010-2030). The IRP also identifies the preferred generation technologies required to meet the expected demand growth up to 2030 and incorporates government objectives including affordable electricity, reduced greenhouse gas (GHG) emissions, reduced water consumption, diversified electricity generation sources and localisation and regional development. In terms of the Integrated Resource Plan Update (2019 IRP Update, 2010-2030), over the short term (of the next two or three years), clear guidelines arose; namely to continue with the current renewable bid programme with additional annual rounds of 1000 MW PV, with approximately 8.4GW of the renewable energy capacity planned to be installed from PV technologies over the next twenty years.

The proposed project is intended to form part of the DMREs Renewable Energy Independent Power Producer Procurement (REIPPP) Programme. The REIPPP Programme aims to secure 14 725 Megawatts (MW) of new generation capacity from renewable energy sources, while simultaneously diversifying South Africa's electricity mix. According to the 2021 State of the Nation Address, Government will soon be initiating the procurement of an additional 11 800 MW of power from renewable energy, natural gas, battery storage and coal in line with the Integrated Resource Plan 2019 and fulfilling their commitments under the United Nations Framework Convention on Climate Change and its Paris Agreement which include the reduction of greenhouse gas emissions. Eskom, the largest greenhouse gas emitter of South Africa, has committed in principle to net zero emissions by 2050 and to increase its renewable capacity.

In response to the above, Jersey Solar Power Plant (RF) (Pty) Ltd is proposing the development of a photovoltaic solar facility and associated infrastructure for the purpose of commercial electricity generation on an identified site located on Portions 1 and 2 of the Farm Illmasdale No. 70, Registration Division IQ, North West Province situated within the JB Marks Local Municipality and the greater Dr Kenneth Kaunda District Municipality (refer to Figure A for the locality map). The project entails the generation of up to 350MW electrical power through photovoltaic (PV) technology. The total development footprint of the project will approximately be 599 hectares process (including supporting infrastructure on site) within the 599 hectares assessed as part of the Environmental Impact Assessment process. From a regional site selection perspective, this region is preferred for solar energy development due to its global horizontal irradiation value of around 2118 kwh/$m^2$.

# EXECUTIVE SUMMARY

Like many other developing municipalities in the country, the JB Marks Local Municipality, within which the Jersey Solar Power Plant is proposed, faces a number of challenges in addressing the needs and improving the lives of the community. The amended integrated development plan (2022-2027) for the Dr Kenneth Kaunda District Municipality identifies key performance areas for the municipality which includes, basic service delivery and infrastructure development, district economic development and municipal institutional development transformation. The Final Integrated Development Plan (IDP) (2023-2024) of the JB Marks Local Municipality states that it is the vision of the municipality to provide "all members of the local community with equitable access to the municipal services that they are entitled to". The IDP aligns with the National Spatial Vision which states that economic growth and employment creation should focus in areas where it is most effective and sustainable, supporting restricting and by fostering development on the basis of local potential. The development of the Jersey Solar Power Plant will contribute to the realisation of the above-mentioned vision and mission of the respective local and district municipalities that will be affected by the proposed development.

Jersey Solar Power Plant (RF) (Pty) Ltd intends to develop a 350MW photovoltaic solar facility and associated infrastructure on Portions 1 and 2 of the Farm Illmasdale No. 70, Registration Division IQ, North West Province situated within the JB Marks Local Municipality and the greater Dr Kenneth Kaunda District Municipality. The town of Ventersdorp is located approximately 27km southwest of the proposed development (refer to Figure A and Figure B for the respective locality and regional maps). The total footprint of the project will be approximately 599 hectares (including supporting infrastructure on site). The site was identified as being highly desirable due to its suitable climatic conditions, topography (i.e., in terms of slope), environmental conditions (i.e., agricultural potential, ecological sensitivity and archaeology), proximity to a grid connection point (i.e., for the purpose of electricity evacuation into the national grid), as well as site access via a main road (i.e., to facilitate the movement of machinery, equipment, infrastructure and people during the construction phase).

In terms of the National Environmental Management Act (Act 107 of 1998), with specific reference to Sections 24 and 24D, as read with GNR 324-327, as amended (2021), Environmental Authorisation is required for the Jersey Solar Power Plant. The following listed activities have been identified with special reference to the proposed development and is listed in the EIA Regulations (as amended):

- Activity 11(i) (GN.R. 327): "The development of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts."
- Activity 24 (ii) (GN.R. 327): "The development of a road (ii) with reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 meters"
- Activity 28 (ii) (GN.R. 327): "Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 1998 and where such development (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare."

- Activity 56 (ii) (GN.R. 327): "The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre (ii) where no reserve exists, where the existing road is wider than 8 metres…"
- Activity 1 (GN.R. 325): "The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more."
- Activity 15 (GN.R. 325): "The clearance of an area of 20 hectares or more of indigenous vegetation."
- Activity 4 (h)(vi) (GN.R. 324): "The development of a road wider than 4 metres with a reserve less than 13,5 metres within (h) the North West, and (vi) areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve.
- Activity 18 (h)(ii) (GN.R. 324): "The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre in (h) North within (ii) areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve.".

Activities required for the development of the solar facility which are listed under Listing Notice 1, 2 and 3 (GNR 327, 325 and 324) implies that the development could potentially have an impact on the environment that will require mitigation. Subsequently a 'thorough assessment process' is required as described in Regulations 21-24 of the EIA Regulations in order to obtain Environmental Authorisation. Environamics has been appointed as the independent consultant to undertake the Environmental Impact Assessment (EIA) on behalf of Jersey Solar Power Plant (RF) (Pty) Ltd.

Regulation 21 of the EIA Regulations requires that an Environmental Impact Report (EIR) must contain the information set out in Appendix 3 of the Regulations or comply with a protocol or minimum information requirements relevant to the application as identified and gazetted by the Minister in a government notice. Appendix 3 of GNR326 requires a full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred site, the scope of the assessment, and the consultation process undertaken be set out in the EIR report. It has been determined through the EIA process that the proposed development will have a net positive impact for the area and will subsequently ensure the optimal utilisation of resources and land, specifically where the affected landowner is experiencing challenges and limitations in terms of the current agricultural land use. All negative environmental impacts can be effectively mitigated through the recommended mitigation measures and no residual negative impacts are foreseen. The potentially most significant environmental impacts associated with the development are briefly summarised below:

Impacts during the construction phase:

During the construction phase minor negative impacts are foreseen over the short term. The latter refers to a period of 12-18 months. The potentially most significant impacts relate to habitat destruction caused by clearance of vegetation and socio-economic impacts such as the creation of direct and indirect employment opportunities, economic multiplier effects from the use of local goods and services and temporary increase in traffic disruptions and movement patterns.

Impacts during the operational phase:

During the operational phase the site will serve as a solar PV energy facility and the potential impacts will take place over a period of 20 – 25 years. The negative impacts are generally associated with habitat destruction caused by clearance of vegetation, displacement of priority avian species from important habitats, collision and electrocutions of avifauna and visual impact of sensitive visual receptors located within a 500m radius of the proposed power line. The provision of sustainable services delivery also needs to be confirmed. The operational phase will have a direct positive impact through the creation of employment opportunities and skills development, development of non-polluting, renewable energy infrastructure and contribution to economic development and social upliftment.

Impacts during the decommissioning phase:

The negative impacts generally associated with the decommissioning phase include: habitat destruction caused by clearance of vegetation and the loss of permanent employment. However, skilled staff will be eminently employable and a number of temporary jobs will also be created in the process. It is not expected that the facility will be decommissioned, but rather that the technology used will be upgraded.

Cumulative impacts:

Cumulative impacts could arise as other similar projects are constructed in the area. The potential for cumulative impacts may therefore exist. The Final Scoping Report includes an assessment of the potential cumulative impacts associated with the proposed development. Potential cumulative impacts with a significance rating of negative medium during the construction phase relate to: habitat destruction and fragmentation, impact on the characteristics of the watercourse, displacement of priority avian species from important habitats, loss of important avian habitats, impacts of employment opportunities, business opportunities and skills development and impact associated with large-scale in-migration of people. Cumulative impacts during the operational phase relate to: habitat destruction and fragmentation, impacts on the characteristics of the watercourse and visual intrusion. The cumulative effect of the generation of waste was identified as being potentially significant during the decommissioning phase.

Regulation 23 of the EIA Regulations determine that an EIA report be prepared and submitted for the proposed activity after the competent authority approves the final scoping report. The EIA report will evaluate and rate each identified impact and identify mitigation measures that may be required. The EIA report will contain information that is necessary for the competent authority to consider the application for Environmental Authorisation and to reach a decision contemplated in Regulation 24 of the EIA Regulations.

## PROJECT DESCRIPTION SUMMARY

The project entails the development of a photovoltaic solar facility and associated infrastructure on Portions 1 and 2 of the Farm Illmasdale No. 70, Registration Division IQ, North West Province situated within the JB Marks Local Municipality and the Dr Kenneth Kaunda District Municipality. The proposed development is located in the North West Province in the northern central interior of South-Africa (refer to Figure B for the regional map). The town of Ventersdorp is located approximately 27km southwest of the proposed development (refer to Figure A for the locality map).

The project entails the generation of up to 350MW electrical power through the operation of photovoltaic (PV) panels. The total development footprint of the project will approximately be 599 hectares (including supporting infrastructure on site) within the 599 hectares assessed as part of this Final Environmental Impact Report. The key components of the proposed project are described below:

- PV Panel Array - To produce up to 350MW, the proposed facility will require numerous linked cells placed behind a protective glass sheet to form a panel. Multiple panels will be required to form the solar PV arrays which will comprise the PV facility. The PV panels will be tilted at a northern angle in order to capture the most sun or using one-axis tracker structures to follow the sun to increase the Yield.
- Wiring to Inverters - Sections of the PV array will be wired to inverters. The inverter is a pulse width mode inverter that converts direct current (DC) electricity to alternating current (AC)electricity at grid frequency.
- Connection to the grid - Connecting the array to the electrical grid requires transformation of the voltage from 480V to 33KV to 132KV to275KV. The normal components and dimensions of a distribution rated electrical substation will be required. Output voltage from the inverter is 480V and this is fed into step up transformers to 132kV. An onsite substation will be required on the site to step the voltage up to 132kV, after which the power will be evacuated into the national grid via the proposed power line. It is expected that generation from the facility will tie in with the via the existing Eskom Hera / Watershed 275kV HV Feeder Overhead Line to the existing Eskom Pluto 400kV/275KV/22KV MTS Substation or Pluto Watershed 275kV Overhead Line. The grid connection have been assessed within a 200m wide (up to 550m wide in some instances) grid connection corridor. The Jersey SPP will inject up to 350MW into the National grid.
- Electrical reticulation network – An internal electrical reticulation network will be required and will be lain ~2-4m underground as far as practically possible.
- Supporting Infrastructure – The supporting infrastructure such as the auxiliary buildings and laydown areas will be situated in an area measuring up to 4 ha.
- Battery storage – A Battery Storage Facility with a maximum height of 8m and a maximum volume of 1,740m$^3$ of batteries and associated operational, safety and control infrastructure.
- Roads – Access will be obtained from N14 to the south of the site and via another unnamed road to the north of the site. An internal site road network will also be required to provide access to the solar field and associated infrastructure.

- Fencing - For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farm. Fencing with a height of 2.5 meters will be used.

The property description for the proposed facility is included in Table 2.1 and for the technical details of the proposed facility please refer to Table 2.3. The exact locations of the proposed infrastructure are indicated by Figures 2.1-2.4 and the coordinates are provided in Table 2.4.

# 1 INTRODUCTION

This section aims to introduce the Environmental Impact Report (EIR) and specifically to address the following requirements of the regulations:

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| **Appendix 3.** (3) An environmental impact assessment report contains the information that is necessary for the competent authority to consider and come to a decision on the application, and must include-(a) details of:<br><br>(i) the EAP who prepared the report; and<br><br>(ii) the expertise of the EAP, including a curriculum vitae. |

## 1.1 LEGAL MANDATE AND PURPOSE OF THE REPORT

The National Environmental Management Act identifies listed activities (in terms of Section 24) which are likely to have an impact on the environment. These activities cannot commence without obtaining an Environmental Authorisation (EA) from the relevant competent authority. Sufficient information is required by the competent authority to make an informed decision and the project is therefore subject to an environmental assessment process which can be either a Basic Assessment Process or a full Scoping and Environmental Impact Assessment process.

The EIA Regulations No. 324, 325 and 327 outline the activities that may be triggered and therefore require EA. The following listed activities with special reference to the proposed development is triggered:

**Table 1.1: Listed activities[1]**

| Relevant notice: | Activity No (s) | Description of each listed activity as per project description: |
|---|---|---|
| GNR. 327 (as amended in 2017) | Activity 11(i) | • "The development of facilities or infrastructure for the transmission and distribution of electricity (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts."<br>• Activity 11(i) is triggered since the proposed photovoltaic solar facility will transmit and |

[1] Please refer to Table 6.2 for detailed description of the relevant aspects of the development that will apply to each specific activity.

| | | |
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| | | distribute electricity of 132 kilovolts outside an urban area. The infrastructure for the distribution of electricity will include a power line (132kV), an on-site HV/MV substation and switching station (132kV). |
| GNR. 327 (as amended in 2017) | Activity 24(ii) | • "The development of a road (ii) with reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 meters;"<br>• Activity 24(ii) is triggered as the internal roads will vary between 6 and 12 meters in width. The internal roads will be 6m in width and the perimeter road will be up to 12m in width. |
| GNR. 327 (as amended in 2017) | Activity 28(ii) | • "Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 1998 and where such development (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare."<br>• Activity 28(ii) is triggered as portions of the affected farm has been previously used for grazing and the property will be re-zoned to "special" use. The development footprint of the solar power plant will be 599 hectares. |
| GNR. 327 (as amended in 2017) | Activity 56(ii): | • "The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre (ii) where no reserve exists, where the existing road is wider than 8 metres"<br>• Activity 56(ii) is triggered as the existing access to the affected property does not have a reserve and will need to be widened by more than 6 metres. |
| GNR. 325 (as amended in 2017) | Activity 1 | • "The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more."<br>• Activity 1 is triggered since the proposed photovoltaic solar facility will generate up to |

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| | | 350 megawatts electricity using a renewable resource. |
| GNR. 325 (as amended in 2017) | Activity 15 | • "The clearance of an area of 20 hectares or more of indigenous vegetation."<br>• In terms of vegetation type the site falls within the Carletonville Dolomite Grassland which is described by Mucina and Rutherford (2006) as 'vulnerable'. Activity 15 is triggered since portions of the site has not been lawfully disturbed during the preceding ten years; therefore, more than 20 hectares of indigenous vegetation will be removed. The development footprint of the solar power plant will be 599ha in extent. |
| GNR. 324 (as amended in 2017) | Activity 4(h)(iv) | • "The development of a road wider than 4 metres with a reserve less than 13,5 metres within (h) the North West, (vi) areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve.<br>• Activity 4(h)(iv) is triggered as internal and perimeter access roads with a width of between 6 and 12 meters will be constructed. The internal roads will be 6m in width and the perimeter(access) roads will be 12m in width and the site is located 5km from the Fred Coetzee nature reserve. |
| GNR. 324 (as amended in 2017) | Activity 18 (h)(ii) | • "The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre in (h) North within (ii) areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve"<br>• Activity 18 (h)(ii) is triggered since the existing access road to the site will need to be widened by more than 4 metres. The site is located 5km from the Fred Coetzee nature reserve. |

The activities triggered under Listing Notice 1, 2 and 3 (Regulation 327, 325 and 324) for the project implies that the development is considered as potentially having a significant impact on the

environment. Subsequently a 'thorough assessment process' is required as described in Regulations 21-24. According to Appendix 3 of Regulation 326 the objective of the Environmental Impact Report (EIR) is to, through a consultative process:

- Identify the relevant policies and legislation relevant to the activity;
- Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- Identify and confirm the preferred activity and technology alternative through an identification of impacts and risks and ranking process of such impacts and risks;
- Identify and confirm the preferred site, through a detailed site selection process, which includes an identification of impacts and risks inclusive of identification of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment
- Identify the key issues to be addressed in the assessment phase
- Agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
- Identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

This report is the Draft Environmental Impact Report (EIR) that was submitted to the Department of Environment, Forestry and Fisheries for a 30-day review and comment period. According to Regulation 326 all registered I&APs and relevant State Departments must also be allowed the opportunity to review the report. The Draft EIR was made available to registered I&APs and all relevant State Departments for a 30-day review period from 03 April 2023 to 08 May 2023 (excluding public holidays). These stakeholders and individuals were requested to provide written comments on the Draft EIR within the allocated timeframe. All issues identified during this review period have been documented and compiled into a Comments and Response Report as part of the Final EIR (**Appendix C7**). All comments received during the Scoping Phase of the project are available in the Comments and Response Report as referred to above, as well as Appendix C5 and C6 of this Final EIR.

## 1.2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Environamics was appointed by the applicant as the independent EAP to conduct the EIA and prepare all required reports. All correspondence to the EAP can be directed to:

Contact person: Lisa de Lange (Opperman)

EAPASA Registration: 2020/2150

Postal Address: 14 Kingfisher Street, Tuscany Ridge Estate, Potchefstroom, 2531

Telephone: 084 920 3111 (Cell)

Electronic Mail: lisa@environamics.co.za

And/or

Contact person: Christia van Dyk

Postal Address: 14 Kingfisher Street, Tuscany Ridge Estate, Potchefstroom, 2531

Telephone: 078 470 5252 (Cell)

Electronic Mail: christia@environamics.co.za

Regulation 13(1)(a) and (b) determines that an independent and suitably qualified and experienced EAP should conduct the EIA. In terms of the independent status of the EAP a declaration is attached as Appendix A to this final report. The expertise of the EAP responsible for conducting the EIA is also summarized in the curriculum vitae included as part of Appendix A.

### 1.3 DETAILS OF SPECIALISTS

Table 1.2 provides information on the specialists that have been appointed as part of the EIA process. Regulation 13(1)(a) and (b) determines that an independent and suitably qualified, experienced and independent specialist should conduct the specialist study, in the event where the specialist is not independent, a specialist should be appointed to externally review the work of the specialist as contemplated in sub regulation (2), must comply with sub regulation 1. In terms of the independent status of the specialists, their declarations are attached as Appendix E to this report. The expertise of the specialists is also summarised in their respective reports.

**Table 1.2:** Details of specialists

| Study | Prepared by | Contact Person | Postal Address | Tel | e-mail |
|---|---|---|---|---|---|
| Avifaunal Assessment | The Biodiversity Company | Andrew Husted | Unit 2, Fern Glen Suites, 420 Vale Avenue, Randburg | Cell: 081 319 1225 | info@thebiodiversitycompany.com |
| Ecological and Wetland Assessment | The Biodiversity Company | Andrew Husted | Unit 2, Fern Glen Suites, 420 Vale Avenue, Randburg | Cell: 081 319 1225 | info@thebiodiversitycompany.com |
| Agricultural and Soil Impact Assessment | The Biodiversity Company | Andrew Husted | Unit 2, Fern Glen Suites, 420 Vale Avenue, Randburg | Cell: 081 319 1225 | info@thebiodiversitycompany.com |
| Heritage Impact Assessment | J van Schalkwyk Heritage Consultant | Johnny van Schalkwyk | 62 Coetzer Avenue Monument Park 0181 | Cell: 076 790 6777 | jvschalkwyk@mweb.co.za |
| Paleontological Study | Banzai Environmental (Pty) Ltd | Elize Butler | - | Cell: 084 447 8759 | elizebutler002@gmail.com |
| Visual Impact Assessment | Donaway Environmental | Johan Botha | 30 Fouche Street<br>Steynsrus, 9515 | Tel: 082 316 7749 | johan@donaway.co.za |

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| Social Impact Assessment | Donaway Environmental | Johan Botha | 30 Fouche Street<br><br>Steynsrus, 9515 | Cell: 082 316 7749 | johan@donaway.co.za |
| Traffic Assessment Study | BVi Consulting Engineers | Liza van Zyl | Edison Square, Century City, 7441 | Cell: 060 557 7467 | dirkvdm@bviwc.co.za<br><br>lizab@bviwc.co.za |

## 1.4 STATUS OF THE EIA PROCESS

The EIA process is conducted strictly in accordance with the stipulations set out in Regulations 21-24 of Regulation No. 326. Table 1.2 provides a summary of the EIA process and future steps to be taken. It can be confirmed that to date:

- A newspaper advertisement was placed in the Potchefstroom Herald on 29 September 2022, informing the public of the EIA process and for the public to register as I&APs.
- A site visit was conducted by the EAP on 29 September 2022.
- Site notices were erected on site on 29 September 2022 informing the public of the commencement of the EIA process.
- An application form and the draft Scoping Report was submitted to DFFE on 12 December 2022.
- The draft Scoping Report were made available for a 30-day review and comment period from 12 December 2022 to 02 February 2023.
- The Final Scoping Report was submitted to the DFFE on 03 February 2023
- The DFFE accepted the Final Scoping Report (FSR) on 13 March 2023.
- The draft Environmental Impact Report was submitted to the DFFE on 03 April 2023.
- The draft Environmental Impact Report was made available for a 30-day review and comment period which were from 03 April 2023 to 08 May 2023 (excluding public holidays).
- The Final EIR was submitted on the 19 May 2023 to the DFFE for decision making.

It is envisaged that the EIA process should be completed within approximately four months of submission of the Final EIR, i.e. by September 2023 – see Table 1.1.3.

**Table 1.3:** Estimated timeframe for completion of the 'scoping and EIA process'

| Activity | Prescribed timeframe | Timeframe |
|---|---|---|
| Site visit | | 29 September 2022 |
| Public participation (BID) | 30 Days | 03 October – 04 November 2022 |
| Submit application form and DSR | - | By 12 December 2022 |
| Public participation (DSR) (excluding the days of reckoning) | 30 Days | 12 December 2022 – 02 February 2023 |
| Submit FSR | 44 Days | 03 February 2023 |
| Department acknowledges receipt | 10 Days | February 2023 |
| Department approves/reject | 43 Days | 13 March 2023 |

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| Public participation (DEIR) (Excl. public holidays) | 30 Days | 03 April – 08 May 2023 |
| Submission of FEIR & EMPr | - | 19 May 2023 |
| Department acknowledges receipt | 10 Days | May 2023 |
| Decision | 107 Days | October 2023 / November 2023 |
| Department notifies of decision | 5 Days | October 2023 / November 2023 |
| Registered I&APs notified of decision | 14 Days | October 2023 / November 2023 |
| Appeal | 20 Days | November 2023 |

### 1.5 SPECIALIST STUDIES IDENTIFIED IN THE DFFE SCREENING TOOL REPORT

The table included below provides an indication of the specialist studies identified by the DFFE Screening Tool Report (Appendix B), an indication of whether the studies were undertaken or not and a motivation or confirmation of the studies being included or not.

**Table 1.4:** Specialist studies identified by the DFFE Screening tool and specialist studies conducted

| Study identified in the DFFE Screening Tool and sensitivity | Study included? | Appendix |
|---|---|---|
| Agricultural Impact Assessment<br><br>Sensitivity: Medium | Yes | An Agricultural Compliance Statement is included in Appendix E4 of the Final EIR.<br><br>The assessment was conducted as per 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, when applying for Environmental Authorisation, which were promulgated in Government Notice No. 320 of 20 March 2020 - refer to the content of the report. |
| Landscape / Visual Impact Assessment<br><br>Sensitivity: Very High | Yes | A Visual Impact Assessment is included in Appendix E3 of the Final EIR.<br><br>As no specific assessment protocol has been prescribed, the required level of assessment must be based on the findings of the Initial Site |

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| | | Sensitivity Verification and must comply with Appendix 6 of the Environmental Impact Assessment Regulations promulgated under sections 24(5) and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (The Act), where a specialist assessment is required. |
| Archaeological and Cultural Heritage Impact Assessment<br><br>Sensitivity: Low | Yes | A Heritage Impact Assessment is included in Appendix E5 of the Final EIR.<br><br>As no specific assessment protocol has been prescribed, the required level of assessment must be based on the findings of the Initial Site Sensitivity Verification and must comply with Appendix 6 of the Environmental Impact Assessment Regulations promulgated under sections 24(5) and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (The Act), where a specialist assessment is required.<br><br>Therefore the assessment was conducted as per the requirements of the National Heritage Resources Act. |
| Palaeontological Impact Assessment<br><br>Sensitivity: Very High | Yes | A Palaeontological Impact Assessment is included in Appendix E6 of the Final EIR.<br><br>As no specific assessment protocol has been prescribed, the required level of assessment must be based on the findings of the Initial Site Sensitivity Verification and must comply with Appendix 6 of the Environmental Impact Assessment Regulations promulgated under sections 24(5) and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (The Act), where a specialist assessment is required.<br><br>Therefore, the assessment was conducted as per the requirements of the National Heritage Resources Act. |

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| Terrestrial Biodiversity Impact Assessment<br><br>Sensitivity: Very High | Yes | A Terrestrial Biodiversity, Plant and Animal Species Impact Assessment Report is included in Appendix E1 of the Scoping Report.<br><br>This assessment has been undertaken in terms of the Protocols of GNR320 – refer to the content of the report. |
| Aquatic Biodiversity Impact Assessment<br><br>Sensitivity: Very High | Yes | A Wetland/Riparian Impact Assessment Report is included in Appendix E1.<br><br>The assessment was conducted as per 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, when applying for Environmental Authorisation, which were promulgated in Government Notice No. 320 of 20 March 2020 - refer to the content of the report. |
| Avian Impact Assessment<br><br>Sensitivity: Very High<br><br>(not listed as a required specialist study in the DFFE Screening Report but is undertaken due to the very high sensitivity of the site) | Yes | Avifauna Impact Assessment Report is included as Appendix E2 of the Final EIR.<br><br>The assessment was conducted as per 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, when applying for Environmental Authorisation, which were promulgated in Government Notice No. 320 of 20 March 2020 - refer to the content of the report. |
| Civil Aviation Assessment<br><br>Sensitivity: Low | No | The identification of the site as low sensitivity considering civil aviation is agreed to by the EAP. This is based on the current land use of the site being used for agricultural purposes.<br><br>The Civil Aviation Authority (CAA) has been identified as an I&AP, and has received the Draft Scoping report for review and commenting. No comments from the CAA have |

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| | | been received as part of the public participation process. |
| Defence Theme<br><br>Sensitivity: Low | No | The site verification report confirms the low sensitivity of the site as no military operations are located close to the development.<br><br>The project is therefore not expected to have an impact on Defence Installations. |
| RFI Assessment<br><br>Sensitivity: Low | No | The site verification is inconclusive as no desktop information could be sought; however on-site evidence of the low sensitivity was available during the site inspection since no potential RFI could be identified.<br><br>The South African Radio Astronomy Observatory (SARAO) have been consulted regarding the development of the project and the Scoping Report has been circulated to SARAO for review and commenting. No comment has been received from SARAO to date. |
| Geotechnical Assessment<br><br>Sensitivity: Not indicated | No | The Geotechnical Assessment will be conducted before construction begins as part of the micro-siting of the facility layout.<br><br>The consideration of geotechnical aspects is considered to be of a technical concern rather than an environmental concern. |
| Socio-Economic Impact Assessment<br><br>Sensitivity: Not indicated | Yes | A Social Impact Assessment is included in Appendix E7 of the Scoping Report.<br><br>As no specific assessment protocol has been prescribed, the required level of assessment must be based on the findings of the Initial Site Sensitivity Verification and must comply with Appendix 6 of the Environmental Impact Assessment Regulations promulgated under sections 24(5) and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (The Act), where a specialist assessment is required. |

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| Plant species Assessment<br><br>Sensitivity: Low | Yes | Refer to Appendix E1. The Terrestrial Biodiversity, Plant and Animal Species Impact Assessment Report also includes the relevant Plant Species Assessment.<br><br>The assessment was conducted as per 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, when applying for Environmental Authorisation, which were promulgated in Government Notice No. 320 of 20 March 2020 - refer to the content of the report. |
| Animal Species Assessment<br><br>Sensitivity: Medium | Yes | Refer to Appendix E1. The Terrestrial Biodiversity, Plant and Animal Species Impact Assessment Report also includes the relevant Animal Species Assessment.<br><br>The assessment was conducted as per 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, when applying for Environmental Authorisation, which were promulgated in Government Notice No. 320 of 20 March 2020 - refer to the content of the report. |

## 1.6 STRUCTURE OF THE REPORT

This report is structured in accordance with the prescribed contents stipulated in Appendix 3 of Regulation No.326. It consists of seven sections demonstrating compliance to the specifications of the regulations as illustrated in Table 1.5.

**Table 1.5: Structure of the report**

| Requirements for the contents of an EIR as specified in the Regulations | Section in report |
|---|---|

| Appendix 3. (3) - An environmental impact assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include- | | |
|---|---|---|
| (a) | details of - | 1 |
| | (i) the EAP who prepared the report; and | |
| | ii) the expertise of the EAP, including a curriculum vitae. | |
| (b) | the location of the activity, including- | 2 |
| | (i) the 21-digit Surveyor General code of each cadastral land parcel; | |
| | (ii) where available, the physical address and farm name; | |
| | (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties; | |
| (c) | a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is- | |
| | (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or | |
| | (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken; | |
| (d) | a description of the scope of the proposed activity, including- | |
| | (i) all listed and specified activities triggered and being applied for; and | |
| | (ii) a description of the associated structures and infrastructure related to the development. | |
| (e) | a description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context. | 3 |
| (f) | a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location; | 4 |
| (g) | A motivation for the preferred development footprint within the approved site. | 5 |
| (h) | a full description of the process followed to reach the proposed development footprint within the approved site, including – | |
| | (i) details of all the development footprint alternatives considered; | |
| | (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; | |
| | (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them. | |
| | (iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; | |
| | (ix) if no alternative development locations for the activity were investigated, the motivation for not considering such; and | |
| | (x) a concluding statement indicating the preferred alternative development location within the approved site. | |
| | (v) the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; | 6 |

| | | |
|---|---|---|
| | (vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks; | |
| | (vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; | |
| | (viii) the possible mitigation measures that could be applied and level of residual risk; | |
| (i) | a full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity, including- | |
| | (i) a description of all environmental issues and risks that were identified during the EIA process; and | |
| | (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures. | |
| (j) | an assessment of each identified potentially significant impact and risk, including- | |
| | (i) cumulative impacts; | |
| | (ii) the nature, significance and consequences of the impact and risk; | |
| | (iii) the extent and duration of the impact and risk; | |
| | (iv) the probability of the impact and risk occurring; | |
| | (v) the degree to which the impact and risk can be reversed; | |
| | (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and | |
| | (vii) the degree to which the impact and risk can be mitigated; | |
| (k) | where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report; | 6 |
| (l) | an environmental impact statement which contains- | 8 |
| | (i) a summary of the key findings of the environmental impact assessment: | |
| | (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and | |
| | (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives; | |
| (m) | based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation; | |
| (n) | the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment; | Not applicable |
| (o) | any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation | Not applicable |
| (p) | a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed; | 8 |

| | | |
|---|---|---|
| (q) | a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation; | |
| (r) | where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised; | 8 |
| (s) | an undertaking under oath or affirmation by the EAP in relation to- | Appendix A to the report |
| | (i) the correctness of the information provided in the report; | |
| | (ii) the inclusion of comments and inputs from stakeholders and interested and affected parties (I&APs); | |
| | (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and | |
| | (iv) any information provided by the EAP to I&APs and any responses by the EAP to comments or inputs made by I&APs; | |
| (t) | where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts; | Not applicable |
| (u) | an indication of any deviation from the approved scoping report, including the plan of study, including- | Not applicable |
| | (i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and | |
| | (ii) a motivation for the deviation; | |
| (v) | any specific information that may be required by the CA; and | Not applicable |
| (w) | any other matters required in terms of section 24(4)(a) and (b) of the Act. | Not applicable |

# 2 ACTIVITY DESCRIPTION

This section aims to address the following requirements of the regulations:

**Appendix 3.** (3) An EIR (...) must include-

(b) the location of the activity, including-

(i) the 21-digit Surveyor General code of each cadastral land parcel;

(ii) where available, the physical address and farm name;

(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;

(c) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is-

(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or

(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;

(d) a description of the scope of the proposed activity, including-

(i) all listed and specified activities triggered and being applied for;

(ii) a description of the associated structures and infrastructure related to the development.

## 2.1 THE LOCATION OF THE ACTIVITY AND PROPERTY DESCRIPTION

The activity entails the development of a photovoltaic solar facility and associated infrastructure on Portions 1 and 2 of the Farm Illmasdale No. 70, Registration Division IQ, North West Province situated within the JB Marks Local Municipality and the Dr Kenneth Kaunda District Municipality. The proposed development is located in the North West Province in the northern central interior of South-Africa (refer to Figure B for the regional map). The town of Ventersdorp is located approximately 27km southwest of the proposed development (refer to Figure A for the locality map).

The project entails the generation of up to 350MW electrical power through the operation of photovoltaic (PV) panels. The total development footprint of the project will approximately be 599 hectares (including supporting infrastructure on site) within the 599 hectares assessed as part of this Final Environmental Impact Report (refer to Table 2.1 for general site information). The property on which the facility is to be constructed will be leased by Jersey Solar Power Plant (RF) (Pty) Ltd from the property owner, Almoro Landgoed (Pty) Ltd and Illmasdale Pty Ltd, for the lifespan of the project (minimum of 20 years).

It is expected that generation from the facility will connect to the national grid via the existing Eskom Hera / Watershed 275kV HV Feeder Overhead Line to the existing Eskom Pluto 400kV/275KV/22KV MTS Substation.

**Table 2.1:** General site information

| | |
|---|---|
| Description of affected farm portion | Solar Power Plant<br>Portion 1 of the Farm Illmasdale No. 70<br>Portion 2 of the Farm Illmasdale No. 70<br>Power Line<br>Portion 2 of the Farm Illmasdale No. 70 |
| Province | North West |
| District Municipality | Dr Kenneth Kaunda District Municipality |
| Local Municipality | JB Marks Local Municipality |
| Ward numbers | 31 |
| Closest towns | Ventersdorp is located approximately 27km southwest of the proposed development. |
| 21 Digit Surveyor General codes | Solar Power Plant<br>Portion 1 of the Farm Illmasdale No. 70<br>T0IQ00000000007000001<br>Portion 2 of the Farm Illmasdale No. 70<br>T0IQ00000000007000002<br>Power Line<br>Portion 2 of the farm Illmasdale No. 70<br>T0IQ00000000007000002 |
| Type of technology | Photovoltaic solar facility |
| Structure Height | Panels ~6m, buildings ~ 6m, power line ~32m and battery storage facility ~8m height |
| Battery storage | Within a 4-hectare area |

| | |
|---|---|
| Surface area to be covered (Development footprint) | Approximately 599 ha |
| Laydown area dimensions (EIA footprint) | Assessed 599 ha |
| Structure orientation | The panels will either be fixed to a single-axis horizontal tracking structure where the orientation of the panel varies according to the time of the day, as the sun moves from east to west or tilted at a fixed angle equivalent to the latitude at which the site is in order to capture the most sun. |
| Generation capacity | Up to 350MW (415MW installed capacity) |
| Expected production | 740-840 GWh per annum (Expected production by 350MWdc modules considering bifacial and one-axis tracker) |

The site is located in a rural area and is bordered by farms where mainly agricultural activities and game farming are undertaken. The site survey revealed that the affected property currently consists of game grazing – refer to plates 1- 9 for photographs of the development area.

## 2.2 ACTIVITY DESCRIPTION

The proposed development will trigger the following activities:

**Table 2.2: Listed activities[2]**

| Relevant notice: | Activity No (s) | Description of each listed activity as per project description: |
|---|---|---|
| GNR. 327 (as amended in 2017) | Activity 11(i) | • "The development of facilities or infrastructure for the transmission and distribution of electricity (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts."<br>• Activity 11(i) is triggered since the proposed photovoltaic solar facility will transmit and distribute electricity of 132 kilovolts outside an urban area. The infrastructure for the distribution of electricity will include a power |

[2] Please refer to Table 6.2 for a detailed description of the relevant aspects of the development that will apply to each specific listed activity.

| | | |
|---|---|---|
| | | line (132kV), an on-site HV/MV substation and switching station (132kV). |
| GNR. 327 (as amended in 2017) | Activity 24(ii) | • "The development of a road (ii) with reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 meters;"<br>• Activity 24(ii) is triggered as the internal roads will vary between 6 and 12 meters in width. The internal roads will be 6m in width and the perimeter road will be up to 12m in width. |
| GNR. 327 (as amended in 2017) | Activity 28(ii) | • "Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 1998 and where such development (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare."<br>• Activity 28(ii) is triggered as portions of the affected farm has been previously used for grazing and the property will be re-zoned to "special" use. The development footprint of the solar power plant will be 599 hectares. |
| GNR. 327 (as amended in 2017) | Activity 56(ii): | • "The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre (ii) where no reserve exists, where the existing road is wider than 8 metres"<br>• Activity 56(ii) is triggered as the existing access to the affected property does not have a reserve and will need to be widened by more than 6 metres. |
| GNR. 325 (as amended in 2017) | Activity 1 | • "The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more."<br>• Activity 1 is triggered since the proposed photovoltaic solar facility will generate up to 350 megawatts electricity using a renewable resource. |
| GNR. 325 (as | Activity 15 | • "The clearance of an area of 20 hectares or more of indigenous vegetation." |

| | | |
|---|---|---|
| amended in 2017) | | • In terms of vegetation type the site falls within the Carletonville Dolomite Grassland which is described by Mucina and Rutherford (2006) as 'vulnerable'. Activity 15 is triggered since portions of the site has not been lawfully disturbed during the preceding ten years; therefore, more than 20 hectares of indigenous vegetation will be removed. The development footprint of the solar power plant will be 599ha in extent. |
| GNR. 324 (as amended in 2017) | Activity 4(h)(iv) | • "The development of a road wider than 4 metres with a reserve less than 13,5 metres within (h) the North West, (vi) areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve.<br>• Activity 4(h)(iv) is triggered as internal and perimeter access roads with a width of between 6 and 12 meters will be constructed and the site is located 5km from the Fred Coetzee nature reserve. |
| GNR. 324 (as amended in 2017) | Activity 18 (h)(ii) | • "The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre in (h) North within (ii) areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve"<br>• Activity 18 (h)(ii) is triggered since the existing access road to the site will need to be widened by more than 4 metres. The site is located 5km from the Fred Coetzee nature reserve. |

The potentially most significant impacts will occur during the construction phase of the development, which will include the following activities:

- Site clearing and preparation: Certain areas of the site will need to be cleared of vegetation and some areas may need to be levelled.
- Civil works to be conducted:
  - Terrain levelling if necessary– Levelling will be minimal as the potential site chosen is relatively flat.

- Laying foundation- The structures will be connected to the ground through cement pillars, cement slabs or metal screws. The exact method will depend on the detailed geotechnical analysis.
- Construction of access and internal roads/paths – existing paths will be used were reasonably possible. Access will be obtained via the N14 to the south of the site and via another unnamed road to the south of the site. Additionally, the turning circle for trucks will also be taken into consideration. An internal site road network will also be required to provide access to the solar field and associated infrastructure.
- Trenching – all Direct Current (DC) and Alternating Current (AC) wiring within the PV plant will be buried underground. Trenches will have a river sand base, space for pipes, backfill of sifted soil and soft sand and concrete layer where vehicles will pass.

## 2.3 PHOTOVOLTAIC TECHNOLOGY

The term photovoltaic describes a solid-state electronic cell that produces direct current electrical energy from the radiant energy of the sun through a process known as the Photovoltaic Effect. This refers to light energy placing electrons into a higher state of energy to create electricity. Each PV cell is made of silicon (i.e. semiconductors), which is positively and negatively charged on either side, with electrical conductors attached to both sides to form a circuit. This circuit captures the released electrons in the form of an electric current (direct current). The key components of the proposed project are described below:

- PV Panel Array - To produce up to 350MW, the proposed facility will require numerous linked cells placed behind a protective glass sheet to form a panel. Multiple panels will be required to form the solar PV arrays which will comprise the PV facility. The PV panels will be tilted at a northern angle in order to capture the most sun.
- Wiring to Central Inverters - Sections of the PV array will be wired to central inverters. The inverter is a pulse width mode inverter that converts direct current (DC) electricity to alternating current (AC) electricity at grid frequency.
- Connection to the grid - Connecting the array to the electrical grid requires transformation of the voltage from 480V to 33kV to 132kV. The normal components and dimensions of a distribution rated electrical substation will be required. Output voltage from the inverter is 480V and this is fed into step up transformers to 132kV. An onsite substation will be required on the site to step the voltage up to 132kV, after which the power will be evacuated into the national grid. Whilst Jersey Solar Power Plant (RF) (Pty) Ltd has not yet received a cost estimate letter from Eskom, it is expected that generation from the facility will tie in with the via the existing Eskom Hera / Watershed 275kV HV Feeder Overhead Line to the existing Eskom Pluto 400kV/275KV/22KV MTS Substation or Pluto Watershed 275kV Overhead Line. The connection options will be assessed within the same 200m wide (up to 550m wide in some instances) grid connection corridor. The Jersey SPP will inject up to 350MW into the National grid.
- Electrical reticulation network – An internal electrical reticulation network will be required and will be lain ~2-4m underground as far as practically possible.
- Supporting Infrastructure – The supporting infrastructure such as the auxiliary buildings and laydown areas will be situated in an area measuring up to 4 ha.

- Battery storage – A Battery Storage Facility with a maximum height of 8m and a maximum volume of 1,740 m3 of batteries and associated operational, safety and control infrastructure.
- Roads – Access will be obtained from N14 to the south of the site and via another unnamed road to the north of the site. An internal site road network will also be required to provide access to the solar field and associated infrastructure. The access and internal roads will be constructed within a 25-meter corridor.
- Fencing - For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farm. Fencing with a height of 2.5 meters will be used.

## 2.4 LAYOUT DESCRIPTION

The layout plan will follow the limitations of the site and aspects such as environmentally sensitive areas, roads, fencing and servitudes on site will be considered – refer to Figure H and Figure I.

The total surface area proposed include the PV panel arrays spaced to avoid shadowing, access and maintenance roads and associated infrastructure (buildings, power inverters, transmission lines and perimeter fences). Limited features of environmental significance exist on site apart from the man-made dam. A final layout plan is included as Figure I. Table 2.3 below provides detailed information regarding the layout for the proposed facility as per DFFE specifications.

**Table 2.3:** Technical details for the proposed facility

| Component | Description / dimensions |
|---|---|
| Height of PV panels | Up to 6 meters |
| Area of PV Array | 599 Hectares (Development footprint) |
| Number of inverters required | Minimum 50 |
| Area occupied by inverter / transformer stations / substations / BESS | Central inverters+ LV/MV trafo: 750 $m^2$<br>HV/MV substation with switching station:<br>20 000 $m^2$<br>BESS: 4ha |
| Capacity of on-site substation | 132kV |
| Capacity of the power line | 132kV |
| Area occupied by both permanent and construction laydown areas | Total footprint: 599 Hectares<br>Construction Laydown Area: ~3ha |
| Area occupied by buildings | Security Room: ~150 $m^2$<br>O&M laydown: within 3.5ha |

| | |
|---|---|
| Battery storage facility | Maximum height: 8m<br>Maximum volume: 1740 $m^3$<br>Capacity: Up to 350MW |
| Length of internal roads | Approximately 30 km |
| Width of internal roads | Between 4 & 6 meters |
| Proximity to grid connection | Approximately 94km |
| Grid connection corridor width | 200 and up to 550m in width |
| Grid connection corridor length | Up to ~94m |
| Power line servitude width | 32m |
| Height of fencing | Approximately 2.5 meters |

Table 2.4 and Figure 2.1 to 2.4 provide and illustrate the coordinate points for the proposed project site, associated infrastructureand grid connection corridor options.

**Table 2.4:** Coordinates

| Coordinates | | | |
|---|---|---|---|
| Project Site | A | 26° 8'31.70"S | 27° 4'27.14"E |
| | B | 26° 8'34.78"S | 27° 5'11.51"E |
| | C | 26° 8'33.27"S | 27° 5'35.72"E |
| | D | 26°10'4.79"S | 27° 5'44.46"E |
| | E | 26°10'13.68"S | 27° 4'27.37"E |
| Proposed Access Road Option 1 (Preferred Alternative) | 1 | 26°10'25.59"S | 27° 2'43.08"E |
| | 2 | 26°10'24.17"S | 27° 2'54.26"E |
| | 3 | 26°10'21.92"S | 27° 2'56.44"E |
| | 4 | 26°10'2.74"S | 27° 5'44.22"E |
| Proposed Access Point (Option 2) | 1 | 26°10'24.66"S | 27° 2'43.03"E |
| | 2 | 26°10'23.38"S | 27° 2'55.07"E |
| | 3 | 26°10'21.92"S | 27° 2'56.44"E |

| | | | |
|---|---|---|---|
| | 4 | 26°10'2.74"S | 27° 5'44.22"E |
| Proposed Access Point (Option 3) | 1 | 26°10'25.59"S | 27° 2'52.33"E |
| | 2 | 26°10'25.59"S | 27° 2'52.33"E |
| | 3 | 26°10'2.74"S | 27° 5'44.22"E |
| Battery Energy Storage System (BESS) | A | 26° 9'56.33"S | 27° 4'27.63"E |
| | B | 26° 9'56.33"S | 27° 4'38.43"E |
| | C | 26°10'2.88"S | 27° 4'38.45"E |
| | D | 26°10'2.85"S | 27° 4'27.63"E |
| Substation | A | 26°10'3.24"S | 27° 4'27.65"E |
| | B | 26°10'3.30"S | 27° 4'33.06"E |
| | C | 26°10'10.51"S | 27° 4'33.05"E |
| | D | 26°10'10.48"S | 27° 4'27.65"E |
| Connection Option | | | |
| Power Line Corridor | A | 26°10'10.56"S | 27° 4'27.35"E |
| | B | 26°10'10.51"S | 27° 4'33.05"E |
| | C | 26°10'13.98"S | 27° 4'33.03"E |
| | D | 26°10'14.59"S | 27° 4'27.36"E |

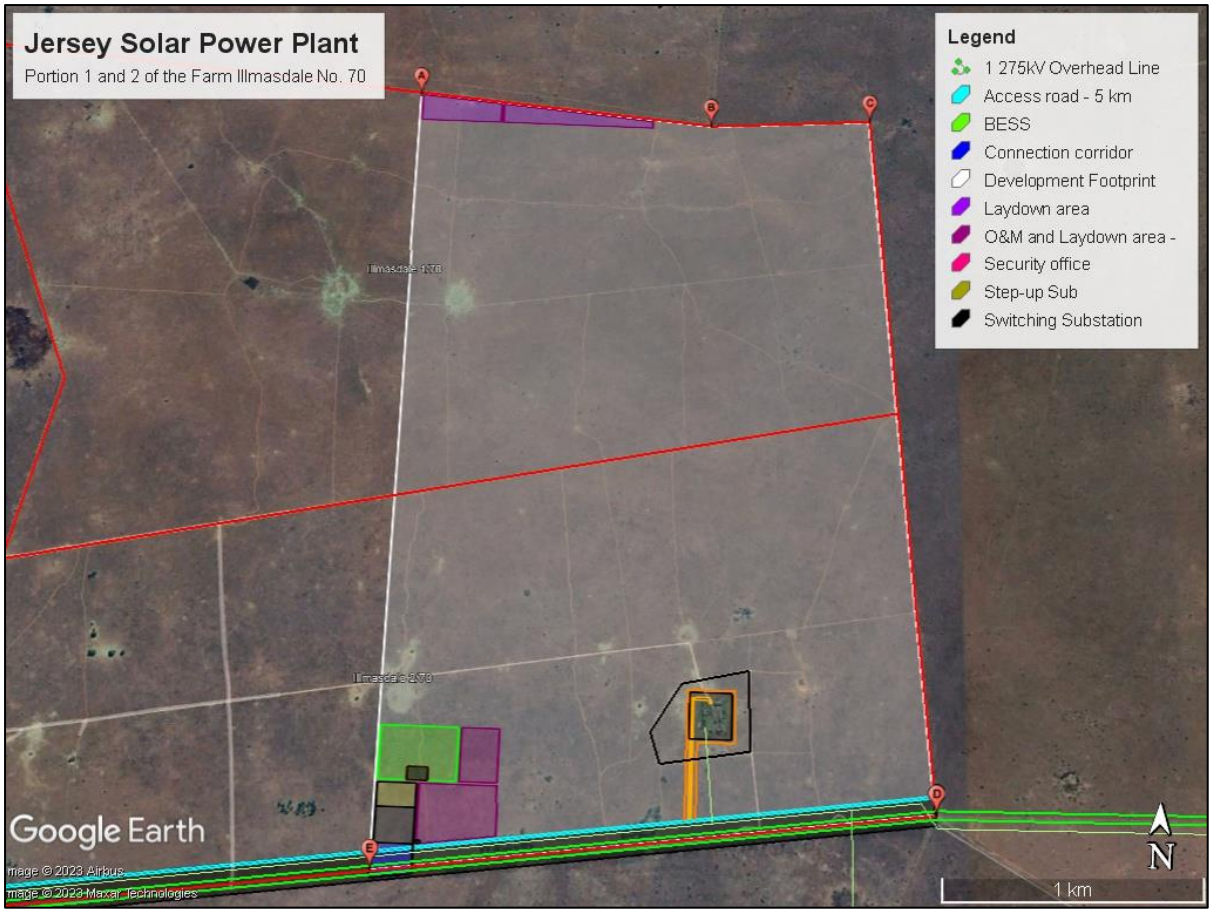


**Figure 2.1:** Map indicating the project site coordinate points of the proposed Jersey Solar Power plant

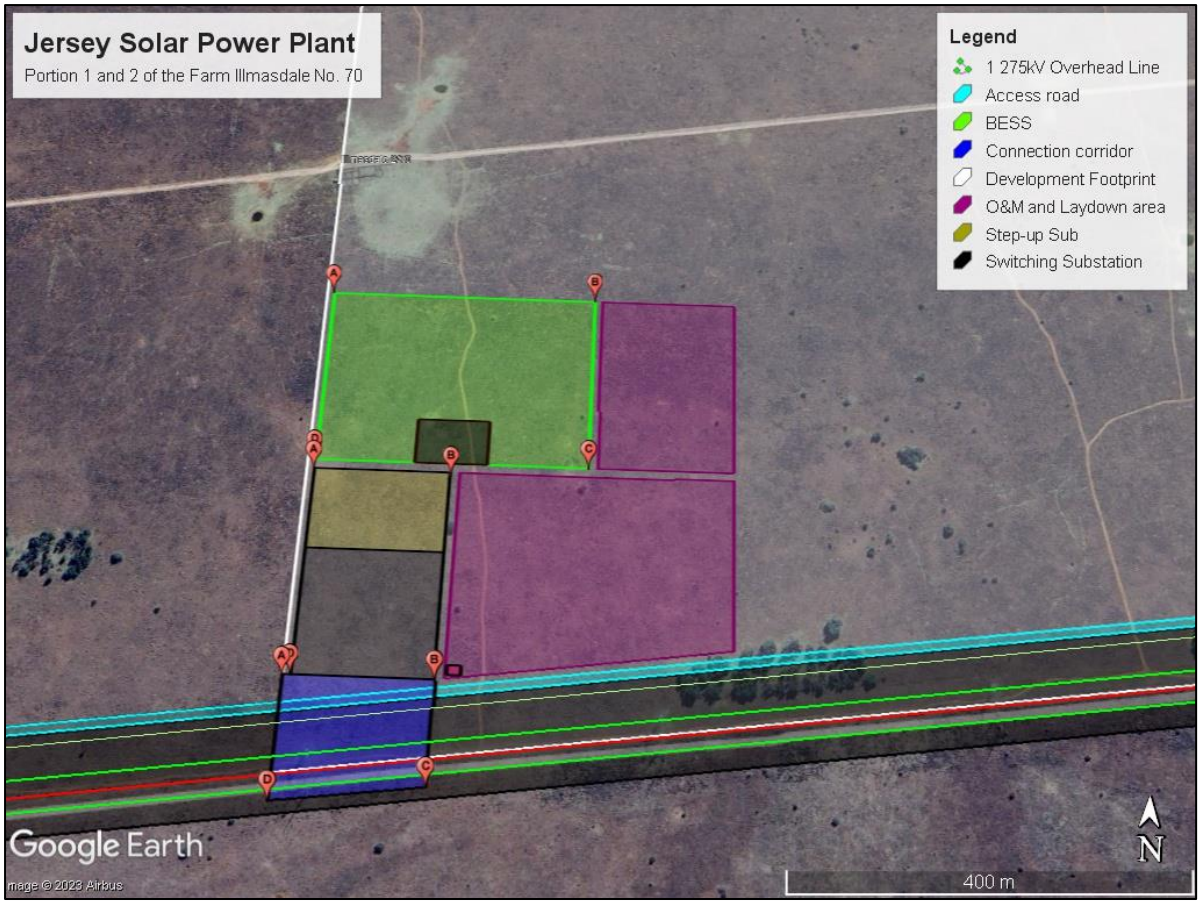


**Figure 2.2:** Map indicating coordinate points of the proposed Jersey Solar Power Plant power line connecting the step-up substation, switching substation and the Battery Energy Storage Facility (BESS).

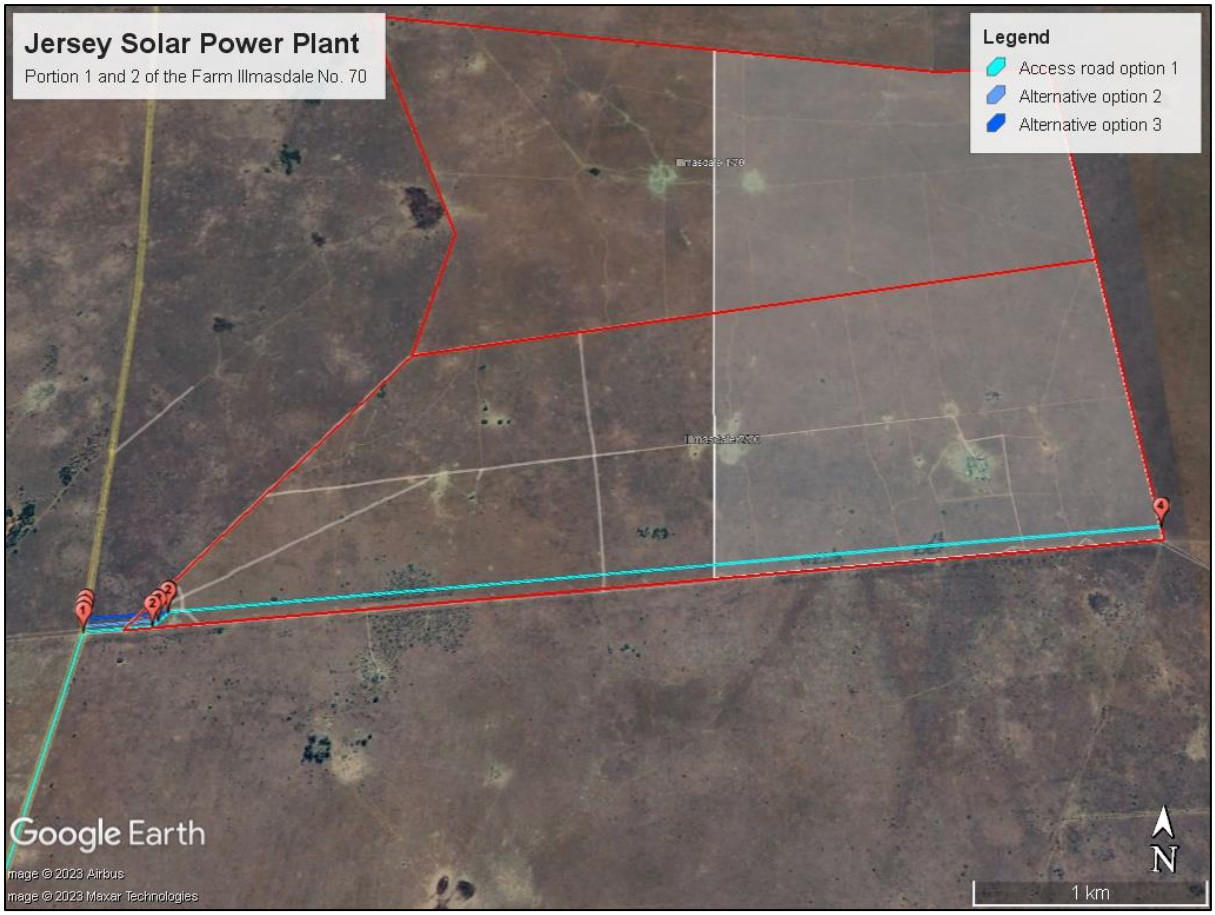


**Figure 2.3:** Map indicating coordinate points of the proposed Jersey Solar Power Plant access road alternatives.

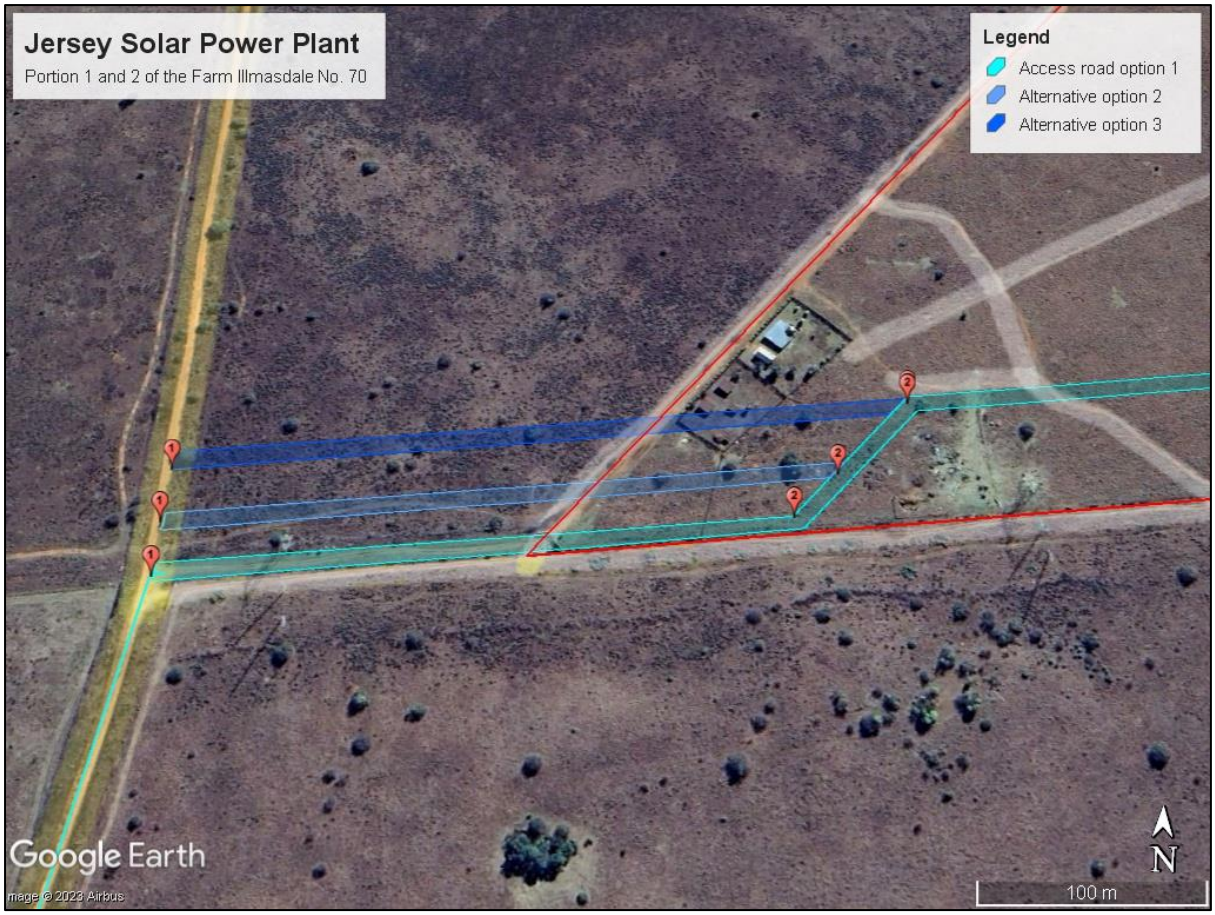


**Figure 2.4:** Close up map indicating coordinate points of the proposed Jersey Solar Power Plant access road alternatives.

## 2.5 SERVICES PROVISION

The following sections provide information on services required on the site e.g., water, sewage, refuse removal, and electricity.

### 2.5.1 Water

Adequate provision of water will be a prerequisite for the development. Water for the proposed development will most likely be obtained from ground water resources or alternatively collected with water trucks from an authorized water service provider and stored on site. The Department of Water and Sanitation has been contacted by the project proponent to confirm the water resource availability in the relevant catchment management area in order to ensure sustainable water supply (refer to Appendix F for proof of correspondence). A full assessment of the application for water use authorisation will only be undertaken in the event that the project proponent has obtained preferred bidder status by the Department of Mineral Resources and Energy.

The estimated maximum amount of water required during construction is 1200m³ per month during the 12 - 18 months of construction. The estimated maximum amount of water required during the facility's 20 years of production is 4200m³ per annum. The majority of this usage is for the cleaning of the solar panels. Since each panel requires approximately 2 litres of water for cleaning, the total

amount of ~500 000 panels will require 1 000 000 litres per wash. It is estimated that the panels may only need to be washed twice per annum, but provision is made for quaternary cleaning (March, May, July, and September). This totals approximately 4,000,000 litres per annum for washing, and allows 200,000 litres per annum (or 548 litres per day) for toilet use, drinking water, etc.

Drinking water supplied will comply with the SANS:241 quality requirements. Water quality from the borehole will be tested to confirm SANS:214 quality, if water quality is not sufficient for drinking, bottled water will be supplied to staff during construction and operational phases of the project.

Water saving devices and technologies such as the use of dual flush toilets and low-flow taps, the management of stormwater, the capture and use of rainwater from gutters and roofs will be considered by the developer. Furthermore, indigenous vegetation will be used during landscaping and the staff will be trained to implement good housekeeping techniques.

### 2.5.2 Stormwater

To avoid soil erosion, it is recommended that the clearing of vegetation be limited. Stormwater management and mitigation measures will be included in the Environmental Management Programme (EMPr) to be submitted as part of the EIR.

### 2.5.3 Sanitation and waste removal

Portable chemical toilets will be utilised, that will be serviced privately or by the local municipality. Waste will be disposed at a licensed landfill site. The construction- and hazardous waste will be removed and disposed of at licensed landfill sites accepting such kinds of wastes. During the operational phase household waste will be removed to a licensed landfill site by a private contractor or by the local municipality. The relevant Local Municipality was requested in a letter to formally confirm that it has the capacity to provide the proposed development with these services for the lifetime of the project (20 years) – refer to Appendix F. To date no feedback has been received.

### 2.5.4 Electricity

During the construction phase of the development, electricity will either be generated on site through a small solar system or through the use of generators or the existing Eskom supply on the affected property will be utilised. This will depend on the Engineering, Procurement, and Construction (EPC) contractor appointed. During operation electricity use will be limited and will primarily be related to the lighting of the facility and domestic use. Design measures such as the use of energy saving light bulbs would be considered by the developer. During the day, electricity will be sourced from the photovoltaic plant, and from the electricity connection at night.

### 2.5.5 Decommissioning of the facility

The operating period will be 20 years from the commencement date of the operation phase. Thereafter two rights of renewal periods of 40 years and 20 years will be relevant. It is anticipated that new PV technologies and equipment will be implemented, within the scope of the Environmental Authorisation, when influencing the profitability of the solar facility.

A likely extension of the plant's lifetime would involve putting new, more efficient, solar panels on the existing structures to improve the efficiency of the facility as the technology improves. The specifications of these new panels will be the same as the current panels under consideration, but the conversion efficiency of sunlight to energy will be greater (comparable to new computer chips, that are the same, but faster and more efficient). If, for whatever reason the plant halts operations, the Environmental Authorisation and contract with the landowner will be respected during the decommissioning phase.

The decommissioning process will consist of the following steps:

- The PV facility would be disconnected from the Eskom grid.
- The inverters and PV modules would be disconnected and disassembled.
- Concrete foundations (if used) would be removed and the structures would be dismantled.
- The underground cables would be unearthed and removed and buildings would be demolished and removed.
- The fencing would be dismantled and removed.
- The roads can be retained should the landowner choose to retain them, alternatively the roads will be removed and the compaction will be reversed.
- Most of the wires, steel and PV modules are recyclable and would be recycled to a reasonable extent. The Silicon and Aluminium in PV modules can be removed and reused in the production of new modules.
- Any rubble and non-recyclable materials will be disposed of at a registered landfill facility.

The rehabilitation of the site would form part of the decommissioning phase. The aim would be to restore the land to its original form (or as close as possible). The rehabilitation activities would include the following:

- Removal of all structures and rubble,
- Breaking up compaction where required, loosening of the soil and the redistribution of topsoil,
- The surface will be restored to the original contours and hydro seeding will take place.

# 3 LEGISLATIVE AND POLICY CONTEXT

This section aims to address the following requirements of the regulations:

**Appendix 3.** (3) An EIR (...) must include-

(e) a description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context.

## 3.1 INTRODUCTION

Environmental decision making with regards to solar PV plants is based on numerous policy and legislative documents. These documents inform decisions on project level environmental authorisations issued by the DFFE as well as comments from local and district authorities. Moreover, it is significant to note that they also inform strategic decision making reflected in the IDPs and SDFs. Therefore, to ensure streamlining of environmental authorisations it is imperative for the proposed activity to align with the principles and objectives of key national, provincial and local development policies and legislation. The following acts and policies and their applicability to the proposed development are briefly summarised:

- The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)
- National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA]
- The National Energy Act, 2008 (Act 34 of 2008)
- National Water Act, 1998 (Act No. 36 of 1998)
- National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
- National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
- The National Heritage Resources Act, 1999 (Act No. 25 of 1999)
- Conservation of Agricultural Resources Act, 1983 (Act No. 85 of 1983)
- The National Forests Act, 1998 (Act 84 of 1998)
- The White Paper on the Energy Policy of the Republic of South Africa (1998)
- The White Paper on Renewable Energy (2003)
- Integrated Energy Plan (IEP) (2016)
- Integrated Resource Plan (IRP) for South Africa (2010-2030) (2019)
- National Development Plan of 2030 (2012)
- National Infrastructure Plan of South Africa (2012)
- New Growth Path Framework (2010)
- Climate Change Bill (2018)
- Strategic Integrated Projects (SIPs) (2010 – 2030)
- Strategic Environmental Assessment (SEA) for wind and solar PV Energy in South Africa (2014)
- North West Provincial Spatial Development Framework (PSDF) (2016)
- Dr Kenneth Kaunda District Municipality Amended Integrated Development Plan (IDP) 2017--2022 (2020)

- JB Marks Local Municipality final Integrated Development Plan 2023/2024

The key principles and objectives of each of the legislative and policy documents are briefly summarised in Table 3.1 and Table 3.2 to provide a reference framework for the implications for the proposed activity.

### 3.2 LEGISLATIVE CONTEXT

**Table 3.1: Legislative context for the construction of photovoltaic solar plants**

| LEGISLATION | ADMINISTERING AUTHORITY | DATE | SUMMARY / IMPLICATIONS FOR PROPOSED DEVELOPMENT |
|---|---|---|---|
| The Constitution of South Africa<br><br>(Act No. 108 of 1996) | National Government | 1996 | The Constitution is the supreme law of the Republic and all law and conduct must be consistentwith the Constitution. The Chapter on the Bill of Rights contains a number of provisions, whichare relevant to securing the protection of the environment. Section 24 states that "everyone has the right to (a) an environment that is not harmful to their health or well-being and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that – (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. TheConstitution therefore, compels government to give effect to the people's environmental rightand places government under a legal duty to act as a responsible custodian of the country's environment. It compels government to pass legislation and use other measures to protect theenvironment, to prevent pollution and ecological degradation, promote conservation andsecure sustainable development.<br><br>The development of the Jersey Solar Power Plant and the aspects related thereto considers the creation of an environment which is not harmful or degraded through the implementation of appropriate mitigation measures. |
| The National Environmental Management Act<br><br>(Act No. 107 of 1998) | National Department of Environmental Affairs (now known as the Department of Forestry, Fisheries and the | 1998 | NEMA provides for co-operative governance by establishing principles and procedures for decision-makers on matters affecting the environment. An important function of the Act is to serve as an enabling Act for the promulgation of legislation to effectively address integrated environmental management. Some of the principles in the Act are accountability; affordability; cradle to grave management; equity; integration; open information; polluter pays; subsidiary; waste avoidance and |

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| | Environment) and the North West Province Department of Economic, Small Business Development, Tourism and Environmental Affairs (DESTEA) | | minimisation; co-operative governance; sustainable development; and environmental protection and justice.<br><br>The mandate for EIA lays with the National Environmental Management Act (107 of 1998) and the EIA Regulations No. 324, 325, 326, and 327 promulgated in terms of Section 24 of NEMA. The EIA Regulations determine that an Environmental Authorisation is required for certain listed activities, which might have a detrimental effect on the environment.<br><br>The EIA process undertaken for the Jersey Solar Power Plant is in-line with the requirements of NEMA for the Application for Environmental Authorisation. |
| The National Energy Act (Act No. 34 of 2008) | Department of Mineral Resources and Energy | 2008 | One of the objectives of the National Energy Act was to promote diversity of supply of energy and its sources. In this regard, the preamble makes direct reference to renewable resources, including solar: "To ensure that diverse energy resources are available, in sustainable quantities, and at affordable prices, to the South African economy, in support of economic growth and poverty alleviation, taking into account environmental management requirements (…); to provide for (…) increased generation and consumption of renewable energies…" (Preamble).<br><br>Considering that the Jersey Solar Power Plant is proposed to make use of PV technology and the solar resource for the generation of electricity, the proposed project is in-line with the Act. |
| The National Water Act (Act No. 36 of 1998) | Department of Water Affairs (now known as Department of Water and Sanitation) | 1998 | Sustainability and equity are identified as central guiding principles in the protection, use, development, conservation, management and control of water resources. The intention of the Act is to promote the equitable access to water and the sustainable use of water, redress past racial and gender discrimination, and facilitate economic and social development. The Act provides the rights of access to basic water supply and sanitation, and environmentally, it provides for the protection of aquatic and associated ecosystems, the reduction and prevention of pollution and degradation of water resources.<br><br>As this Act is founded on the principle that National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use |

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| | | | of water in the public interest, a person can only be entitled to use water if the use is permissible under the Act. Chapter 4 of the Act lays the basis for regulating water use.<br><br>The site is located within the C31A quaternary catchment and is situated in the Lower Vaal Water Management Area. Should a water use license be required for the project, the National Water Act will Be applicable in terms of obtaining the relevant license. |
| National Environmental Management: Waste Act<br><br>(Act No. 59 of 2008) | National Department Environmental Affairs (DEA) (now known as the Department of Forestry, Fisheries and the Environment) | 2008 | NEMWA has been developed as part of the law reform process enacted through the White Paper on Integrated Pollution and Waste Management and the National Waste Management Strategy (NWMS). The objectives of the Act relate to the provision of measures to protect health, well-being and the environment, to ensure that people are aware of the impact of waste on their health, well-being and the environment, to provide for compliance with the measures, and to give effect to section 24 of the Constitution in order to secure an environment that is not harmful to health and well-being.<br><br>Regulations No. R921 (of 2013) promulgated in terms of Section 19(1) of the National Environmental Management: Waste Act (59 of 2008) determines that no person may commence, undertake or conduct a waste management activity listed in this schedule unless a license is issued in respect of that activity. It is not envisaged that a waste permit will be required for the proposed development as no listed activities in terms of waste management are expected to be triggered. |
| National Environment Management: Air Quality Act<br><br>(Act No. 39 of 2004) | National Department Environmental Affairs (DEA)<br><br>(now known as the Department of Forestry, Fisheries | 2004 | The object of this Act is to protect the environment by providing reasonable measures for the protection and enhancement of the quality of air in the Republic; the prevention of air pollution and ecological degradation; and securing ecologically sustainable development while promoting justifiable economic and social development. |

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| | and the Environment) | | Regulations No. R248 (of 31 March 2010) promulgated in terms of Section 21(1)(a) of the National Environmental Management Act: Air Quality Act (39 of 2004) determine that an Atmospheric Emission License (AEL) is required for certain listed activities, which result in atmospheric emissions which have or may have a detrimental effect on the environment. The Regulation also sets out the minimum emission standards for the listed activities. It is not envisaged that an Atmospheric Emission License will be required for the proposed development. |
| The National Heritage Resources Act<br><br>(Act No. 25 of 1999) | South African Heritage Resources Agency (SAHRA) | 1999 | The Act aims to introduce an integrated and interactive system for the management of heritage resources, to promote good governance at all levels, and empower civil society to nurture and conserve heritage resources so that they may be bequeathed to future generations and to lay down principles for governing heritage resources management throughout the Republic. It also aims to establish the South African Heritage Resources Agency together with its Council to co-ordinate and promote the management of heritage resources, to set norms and maintain essential national standards and to protect heritage resources, to provide for the protection and management of conservation-worthy places and areas by local authorities, and to provide for matters connected therewith.<br><br>The Act protects and manages certain categories of heritage resources in South Africa. For the purposes of the Heritage Resources Act, a “heritage resource” includes any place or object of cultural significance. In this regard the Act makes provision for a person undertaking an activity listed in Section 28 of the Act to notify the resources authority. The resources authority may request that a heritage impact assessment be conducted if there is reason to believe that heritage resources will be affected.<br><br>A case file has been opened on SAHRIS for the Jersey Solar Power Plant and all relevant documents have been submitted for their comments and approval. The Heritage Impact Assessment undertaken for the solar power plant is included as Appendix E5, and the Palaeontological Impact Assessment is included as Appendix E6. |

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| Conservation of Agricultural Resources Act (Act No. 85 of 1983) | National and Provincial Government | 1983 | The objective of the Act is to provide control over the utilisation of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.<br><br>Consent will be required from the Department of Agriculture, Forestry and Fisheries (now known as the Department of Forestry, Fisheries and the Environment) in order to confirm that the proposed development is not located on high potential agricultural land and to approve the long-term lease agreement.<br><br>An Agricultural Compliance Statement has been undertaken for the Jersey Solar Power Plant and is included as Appendix E4 of this Final EIR. |
| The National Forests Act, 1998 (Act 84 of 1998) | Department of Environmental Affairs (now known as the Department of Forestry, Fisheries and the Environment) | 1998 | The purposes of this Act are to:<br><br>(a) promote the sustainable management and development of forests for the benefit of all;<br><br>(b) create the conditions necessary to restructure forestry in State forests;<br><br>(c) provide special measures for the protection of certain forests and trees:<br><br>(d) promote the sustainable use of forests for environmental, economic, educational, recreational, cultural, health and spiritual purposes.<br><br>(e) promote community forestry;<br><br>(f) promote greater participation in all aspects of forestry and the forest products industry by persons disadvantaged by unfair discrimination.<br><br>Section 12(1) read with s15(1) of the NFA stated that the Minister may declare a particular tree, group of trees, woodland; or trees belonging to a particular species, to be a protected tree, group |

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| | of trees, woodland or species. A list of protected tree species was gazetted in GN 635 of 6 December 2019. The effect of the declaration is that no person may (a) cut, disturb, damage or destroy; or (b) possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, or any forest product derived from a protected tree, except under a license granted by the Minister; or in terms of an exemption published by the Minister in the Gazette.<br><br>A Terrestrial Biodiversity Compliance Statement has been undertaken for the Jersey Solar Power Plant and is included in Appendix E3. |

### 3.3 POLICY CONTEXT

**Table 3.2: Policy context for the construction of photovoltaic solar plants**

| POLICY | ADMINISTERING AUTHORITY | DATE | SUMMARY / IMPLICATIONS FOR PROPOSED DEVELOPMENT |
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| The White Paper on the Energy Policy of the Republic of South Africa | Department of Mineral Resources and Energy | 1998 | The White Paper on the Energy Policy of the Republic of South Africa establishes the international and national policy context for the energy sector, and identifies the following energy policy objectives:<br>• Increasing access to affordable energy services<br>• Improving energy governance<br>• Stimulating economic development<br>• Managing energy-related environmental and health impacts<br>• Securing supply through diversity<br>• Energy policy priorities |

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| | | | The White Paper sets out the advantages of renewable energy and states that Government believes that renewables can in many cases provide the least cost energy service, particularly when social and environmental costs are included. The White Paper acknowledges that South Africa has neglected the development and implementation of renewable energy applications, despite the fact that the country's renewable energy resource base is extensive, and many appropriate applications exist.<br><br>The White Paper notes that renewable energy applications have specific characteristics that need to be considered. Advantages include:<br><br>• Minimal environmental impacts in operation in comparison with traditional supply technologies; and<br>• Generally lower running costs, and high labour intensities.<br><br>Disadvantages include:<br><br>• Higher capital costs in some cases;<br>• Lower energy densities; and<br>• Lower levels of availability, depending on specific conditions, especially with sun and wind-based systems.<br><br>The Jersey Solar Power Plant is in line with this policy as it proposes the generation of renewable energy from the solar resource. |
| The White Paper on Renewable Energy | Department of Mineral Resources and Energy | 2003 | This White Paper on Renewable Energy supplements the *White Paper on Energy Policy*, which recognises that the medium and long-term potential of renewable energy is significant. This Paper sets out Government's vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy in South Africa. |

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| | | The White Paper notes that while South Africa is well-endowed with renewable energy resources that have the potential to become sustainable alternatives to fossil fuels, these have thus far remained largely untapped. Government's long-term goal is the establishment of a renewable energy industry producing modern energy carriers that will offer in future years a sustainable, fully non-subsidised alternative to fossil fuels. The medium-term (10-year) target set in the White Paper is: *10 000 GWh (0.8 Mtoe) renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro. The renewable energy is to be utilised for power generation and non-electric technologies such as solar water heating and bio-fuels. This is approximately 4% (1667 MW) of the projected electricity demand for 2013 (41539 MW)* (Executive Summary, ix).<br><br>The Jersey Solar Power Plant is in line with this paper as it proposes the generation of renewable energy from the solar resource. |
| Integrated Energy Plan (IEP) (2016) | Department of Mineral Resources and Energy 2016 | The Integrated Energy Plan (IEP) (which was developed under the National Energy Act (No. 34 of 2008)), recognises that energy is essential to many human activities, and is critical to the social and economic development of a country. The purpose of the IEP is essentially to ensure the availability of energy resources, and access to energy services in an affordable and sustainable manner, while minimising associated adverse environmental impacts. Energy planning therefore needs to balance the need for continued economic growth with social needs, and the need to protect the natural environment.<br><br>The 8 key objectives of the integrated energy planning process, are as follows:<br><br>• Objective 1: Ensure security of supply.<br>• Objective 2: Minimise the cost of energy.<br>• Objective 3: Promote the creation of jobs and localisation.<br>• Objective 4: Minimise negative environmental impacts from the energy sector.<br>• Objective 5: Promote the conservation of water.<br>• Objective 6: Diversify supply sources and primary sources of energy.<br>• Objective 7: Promote energy efficiency in the economy. |

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| | | | • Objective 8: Increase access to modern energy.<br><br>The Jersey Solar Power Plant is in line with this policy as it proposes the generation of renewable energy from the solar resource. |
| Integrated Resource Plan (IRP) for South Africa | Department of Mineral Resources and Energy | 2019 | The Integrated Resource Plan (IRP) for Electricity 2010 – 2030 is a subset of the IEP and constitutes South Africa's National electricity plan. The primary objective of the IRP is to determine the long-term electricity demand and detail how this demand should be met in terms of generating capacity, type, timing and cost. The IRP also serves as input to other planning functions, including amongst others, economic development and funding, and environmental and social policy formulation.<br><br>The current iteration of the IRP led to the Revised Balanced Scenario (RBS) that was published in October 2010. Following a round of public participation which was conducted in November / December 2010, several changes were made to the IRP model assumptions. The document outlines the proposed generation new-build fleet for South Africa for the period 2010 to 2030. This scenario was derived based on a cost-optimal solution for new-build options (considering the direct costs of new build power plants), which was then "balanced" in accordance with qualitative measures such as local job creation.<br><br>The Policy-Adjusted IRP reflected recent developments with respect to prices for renewables. In addition to all existing and committed power plants, the plan includes 9.6GW of nuclear, 6.25GW of coal, 17.8GW of renewables, and approximately 8.9GW of other generation sources such as hydro, and gas. Besides capacity additions, several assumptions have changed since the promulgation of IRP 2010–2030. Key assumptions that changed include the electricity demand projection, Eskom's existing plant performance, as well as new technology costs. These changes necessitated the review and update of the IRP which resulted in the draft IRP 2018. According to the South African Energy Sector Overview (2021), there is currently 1 723MW of installed PV capacity, while an additional 2 600MW from wind and solar has been rewarded as part of Bid window 5. |

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| | | | The Jersey Solar Power Plant is in line with this plan as it proposes the generation of renewable energy from the solar resource and will contribute to the energy mix of the country as set out in this plan. |
| National Development Plan of 2030 | The Presidency: National Planning Commission | - | The National Development Plan aims to "eliminate poverty and reduce inequality by 2030" (RSA, undated). In order to eliminate or reduce inequality, the economy of South Africa needs to grow faster in order to benefit all South Africans. In May 2010 a draft national development plan was drafted, which highlighted the nine (9) key challenges for South Africa. The highest priority areas according to the plan are considered to be the creation of employment opportunities and to improve the quality of national education. In this regard, the plan sets out three (3) priority areas, namely, to raise employment by a faster growing economy, improve the quality of education, and to build the capability of the state in order to play a more developmental and transformative role. One of the key challenges identified was that the economy is unsustainably resource intensive, and the acceleration and expansion of renewable energy was identified as a key intervention strategy to address this challenge.<br><br>The development of the Jersey Solar Power Plant will contribute to the intervention strategy as identified within the plan. |
| National Infrastructure Plan of South Africa | Presidential Infrastructure Coordinating Commission | 2012 | In the year 2012 the South African Government adopted a National Infrastructure Plan (hereafter referred to as the Plan). The aim of this Plan is to transform the economic landscape, while strengthening the delivery of basic services and creating new employment opportunities. This Plan also supports the integration of African communities, and also sets out the challenges and enablers that our country needs in order to respond to the planning and development of infrastructure with regards to fostering economic growth (RSA, 2012). The Plan has developed eighteen (18) strategic integrated projects (further referred to as SIPs). These SIPs stretch over all nine (9) provinces, covering social and economic infrastructure, and projects that enhances development and growth. Of the eighteen (18), five (5) are geographically focused, three (3) spatial, three (3) energy, three (3) social infrastructure, two (2) knowledge, one (1) regional integration, and one (1) water and sanitation focussed. The three (3) SIPs according to the Plan, which are energy focused and correlate to the proposed project are as follow:<br><br>- SIP 8: Green energy in support of the South African economy; |

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| | | - SIP 9: Electricity generation to support socio-economic development; and<br>- SIP 10: Electricity transmission and distribution for all.<br><br>SIP 8 according to the Plan "support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the IRP 2010 and support bio-fuel production facilities". The purpose of SIP 9 according to the Plan is to "accelerate the construction of new electricity generation capacity in accordance with the IRP 2010 to meet the needs of the economy and address historical imbalances". SIP 9 should also monitor the implementation of major projects such as new power stations like Medupi, Kusile and Ingula. Lastly, SIP 10 aims to "expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development" (RSA, 2012:20).<br><br>The Jersey Solar Power Plant is in line with this plan as it proposes the generation of renewable energy from the solar resource which supports socio-economic development and will contribute to meeting the electricity demand of the country as set out in this plan. |
| New Growth Path Framework | Department of - Economic Development | The New Growth Path was developed after 16 years of South Africa's democracy, to respond to emerging opportunities and risks while building on policies. This framework provides a dynamic vision on how to collectively achieve a more developed, equitable and democratic society and economy. This framework mainly reflects the commitment of the South African Government to create employment opportunities for its people in all economic policies (RSA, 2011b).<br><br>This framework sets out the markers for job creation and growth and also identify where there are viable changes in the character and structure of production, in order to create a more inclusive, greener economy on the long-term. It is stated in the framework that in order for this framework to reach its objectives, the Government is committed to:<br><br>- Identify the possible areas of employment creation; and<br>- Develop a policy to facilitate employment creation especially with regards to social equity, sustainable employment and growth in the creation of employment activities (RSA, 2011b). |

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| | | | This framework also identifies investments in five key areas, one of which is energy. This framework also states that the green economy is a priority area, which includes the construction of and investment in renewable energy technologies like solar (RSA, 2011b). In this regard it will also assist creating employment opportunities over the medium- and long-term.<br><br>Considering that the construction of and investment in renewable energy is a key are identified within the framework, the Jersey Solar Power Plant is considered to be in-line with the framework. |
| Climate Change Bill | National Department of Environmental Affairs (now known as the Department of Forestry, Fisheries and the Environment) | 2018 | On 08 June 2018 the Minister of Environmental Affairs published the Climate Change Bill ("the Bill") for public comment. The Bill provides a framework for climate change regulation in South Africa aimed at governing South Africa's sustainable transition to a climate resilient, low carbon economy and society. The Bill provides a procedural outline that will be developed through the creation of frameworks and plans. The following objectives are set within the Bill:<br><br>• Provide for the coordinated and integrated response to climate change and its impacts by all spheres of government in accordance with the principles of cooperative governance;<br>• Provide for the effective management of inevitable climate change impacts through enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to building social, economic, and environmental resilience and an adequate national adaptation response in the context of the global climate change response;<br>• Make a fair contribution to the global effort to stabilise greenhouse gas concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe and in a manner that enables economic, employment, social and environmental development to proceed in a sustainable manner.<br><br>Jersey Solar Power Plant comprises a renewable energy generation facility and would not result in the generation or release of emissions during its operation. |

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| Strategic Integrated Projects (SIPs) | The Presidential Infrastructure Coordinating Committee | 2010 - 2030 | The Presidential Infrastructure Coordinating Committee (PICC) is integrating and phasing investment plans across 18 Strategic Infrastructure Projects (SIPs) which have five core functions: to unlock opportunity, transform the economic landscape, create new jobs, strengthen the delivery of basic services and support the integration of African economies. A balanced approach is being fostered through greening of the economy, boosting energy security, promoting integrated municipal infrastructure investment, facilitating integrated urban development, accelerating skills development, investing in rural development and enabling regional integration. SIP 8 and 9 of the energy SIPs supports the development of the solar energy facility:<br>• SIP 8: Green energy in support of the South African economy: Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP 2010 – 2030) and supports bio-fuel production facilities.<br>• SIP 9: Electricity generation to support socio-economic development: The proposed Springbok Solar Power Plant is a potential SIP 9 Project as electricity will be generated and social and economic upliftment, development and growth will take place within the surrounding communities. It would become a SIP 9 project if selected as a Preferred Bidder project by the Department of Energy. SIP 9 supports the acceleration of the construction of new electricity generation capacity in accordance with the IRP 2010 to meet the needs of the economy and address historical imbalances.<br>Jersey Solar Power Plant could be registered as a SIP project once selected as a preferred bidder under the REIPPP Programme. The project would then contribute to the above-mentioned SIPs. |
| Strategic Environmental Assessment (SEA) for wind and solar PV Energy in South Africa | National Department of Environmental Affairs (now known as the Department of Forestry, Fisheries and | 2014 | The then Department of Forestry, Fisheries and the Environment (DFFE) has committed to contribute to the implementation of the National Development Plan and National Infrastructure Plan by undertaking Strategic Environmental Assessments (SEAs) to identify adaptive processes that integrate the regulatory environmental requirements for Strategic Integrated Projects (SIPs) while safeguarding the environment. The wind and solar photovoltaic (PV) SEA was accordingly commissioned by DEA in support of SIP 8, which aims to facilitate the implementation of sustainable green energy initiatives. |

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|---|---|---|
| | the Environment) | This SEA identifies areas where large scale wind and solar PV energy facilities can be developed in terms of SIP 8 and in a manner that limits significant negative impacts on the environment, while yielding the highest possible socio-economic benefits to the country. These areas are referred to as Renewable Energy Development Zones (REDZs).<br><br>The REDZs also provide priority areas for investment into the electricity grid. Currently one of the greatest challenges to renewable energy development in South Africa is the saturation of existing grid infrastructure and the difficulties in expanding the grid. Proactive investment in grid infrastructure is the likely to be the most important factor determining the success of REDZs. Although it is intended for the SEA to facilitate proactive grid investment in REDZs, such investment should not be limited to these areas. Suitable wind and solar PV development should still be promoted across the country and any proposed development must be evaluated on its own merit.<br><br>Even though the Jersey Solar Power Plant is not located within a REDZ, it will still contribute to the overall development of renewable energy within the country. |
| North West Provincial Spatial Development Framework (PSDF) | North West Provincial Government 2016 | The North West PSDF is a policy document that promotes a 'developmental state' in accordance with national and provincial legislation and directives. It aligns with the North West Provincial Growth and Development Strategy which has committed the North West to 'building a prosperous, sustainable and growing provincial economy which reduces poverty and improves social development'.<br><br>The PSDF includes comprehensive plans and strategies that collectively indicate which type of land-use should be promoted in the province, where such land-use should take place, and how it should be implemented and managed. In broad terms, the PSDF:<br><br>• Adopt a holistic approach to spatial development in order to minimise the long-term negative impacts of current land use or development decisions.<br>• Ensure that spatial planning serves national, provincial and/or local interest.<br>• Support the long-term adequacy or availability of physical, social and economic resources to support or carry development. |

| | | |
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| | | • Protect existing natural, environmental, and cultural resources.<br>• Ensure that land which is currently in agricultural use would only be reallocated to other uses where real need exists, and prime agricultural land should remain in production.<br>• Support mining as a vital economic driver in the province without jeopardizing the biodiversity value of the environment.<br>• Adopt a climate change strategy that will provide for responsible actions to curb the effect of global warming and climate change.<br><br>The Spatial Challenges and Opportunities provide the crucial components that underlie sustainable development, i.e., need for basic infrastructure and development for the poor, economic growth and development, environmental conservation, and improved livelihoods. These spatial development priorities form the basis for guiding specific decisions regarding the desired spatial development and arrangement of broad land uses within North West and investment and development spending.<br><br>The PSDF provides Spatial Framework and Development Strategies that will manage future growth and associated change in a way that protects and enhance the use of natural resources, biodiversity, and lifestyle values. This requires a highly sustainable pattern of development based on the efficient utilisation of land and infrastructure, supported by management decisions over ad hoc and dispersed forms of development.<br><br>The PSDF builds upon achievements and learns from mistakes of the past, reacts to the challenges of our time, incorporates the traditional knowledge of the people of the North West, and builds upon international best-practice and technology. The development of the Jersey Solar Power Plant is in-line with the framework based on the contributions and opportunities presented by a development of this nature. |
| Dr Kenneth Kaunda District Municipality Amended Integrated | Dr Kenneth Kaunda District Municipality | 2017 - 2022 | The long-term vision of the Dr Kenneth Kaunda DM is: “Exploring prosperity through sustainable service delivery for all”. |

| | |
|---|---|
| Development Plan (IDP) | The above stated vision defines what the Dr Kenneth Kaunda District Municipality would like to attain over medium to long-term, and for that achievement to effectively materialize, their mission is that: "To provide an integrated district management framework in support of quality service delivery".<br><br>The Key Performance Areas Identified for the municipality is:<br><br>• Basic Service Delivery and Infrastructure Development<br>• Municipal Institutional Development Transformation<br>• District Economic Development<br>• Financial viability and management<br>• Good Governance and Public Participation<br>• Spatial Rationale<br><br>Of the eighteen (18) SIPs that are contained in the National Infrastructure Plan (NIP), there are eight which impacts on the Dr Kenneth Kaunda District and therefore need to be recognised and where appropriate; the municipality's plans will be aligned with these SIPs in an effort to respond to national government's service delivery initiatives. Furthermore, work is to be done to align key cross-cutting areas, namely human settlement planning and skills development in line with each of the Strategic Infrastructure Projects, especially:<br><br>• Green Energy in support of the South African economy (SIP 8): Supporting sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP 2010).<br>• Electricity Generation to support socio-economic development (SIP 9): acceleration of the construction of new electricity generation capacity in accordance with the IRP 2010 to meet the needs of the economy; and addressing historical imbalances.<br><br>Considering the plans for the alignment of the DM's plans with SIP 8 and SIP 9 it is confirmed that the Jersey Solar Power Plant is in line with the plan. |

| | | | |
|---|---|---|---|
| JB Marks Local Municipality Final Integrated Development Plan (IDP) | JB Marks Local Municipality | 2020-2021 | The Final Integrated Development Plan (IDP) (2023-2024) of the JB Marks Local Municipality states that it is the vision of the municipality to provide "all members of the local community with equitable access to the municipal services that they are entitled to." <br><br> The Mission Statement is "Provide quality sustainable services that are responsive to our communities' needs within a healthy, safe and green environment through good governance." <br><br> The development of the Jersey Solar Power Plant will contribute to the local economy of the area and assist (albeit to a limited extent) with socio-economic growth and therefore contribute to the strategic objectives of the LM for example to provide all members of the community with equitable access to electricity |

## 3.4 OTHER LEGISLATION

Other legislation mainly refers to the following:

- Planning legislation governing the rezoning process and approval of the layout plan.
- Design standards and legislation for services provision such as water, sewerage, electricity, etc.
- Municipal bylaws related to building plans, building regulations, etc.

## 3.5 RELEVANT GUIDANCE

The following guidance was considered in conducting the EIA:

- The Equator principles III (2013)
- World Bank Group Environmental, Health and Safety General Guidelines (EHS Guidelines) (2007)
- Environmental, Health, and Safety Guidelines for Electric Power Transmission and Distribution (2007)
- International Finance Corporation's Policy on Environmental and Social Sustainability (2012)
- DEA. (2013). Draft National Renewable Energy Guideline. Department of Environmental Affairs, Pretoria, South Africa
- DEA, (2012), Guideline 5 – Final companion to the National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations of 2010
- DEA, (2012), Guideline 7 – Public participation in the Environmental Impact Assessment process
- DEA, (2012), Guideline 9 – Need and desirability
- DEA, (2006), Guideline 3 – General guide to the Environmental Impact Assessment Regulations
- DEAT, (2006), Guideline 4 – Public participation in support of the Environmental Impact Assessment Regulations
- DEAT, (2006), Guideline 5 – Assessment of alternatives and impacts in support of the Environmental Impact Assessment Regulations
- BirdLife, (2017). Best Practise Guidelines Birds & Solar Energy: Guidelines for assessing and monitoring the impact of solar power generating facilities on bird in southern Africa.

## 3.6 CONCLUSION

The EIA was undertaken in accordance with the EIA Regulations (as amended) published in GNR 326, in terms of Section 24(5) and 44 of the NEMA as amended as well as all relevant National legislation, policy documents and national guideline, the World Bank EHS Guidelines, the IFC Performance Standards, and the Equator Principles.

The legislative and policy context plays an important role in identifying and assessing the potential social impacts associated with the proposed development, as well as an indication of the need and desirability of the proposed development from a national, provincial and local level. For this reason, the proposed development project will be assessed in terms of its fit with the key legislative, policy and planning documents discussed above.

The main findings of the review of the policy documents on all spheres of Government indicated that strong support was given towards renewable energy, specifically PV solar energy and therefore it is concluded that there is support for the development of the Jersey Solar Power Plant. The White Paper on the Energy Policy of the Republic of South Africa of 1998 stated that due to the fact that renewable energy resources operate from an unlimited resource base, i.e., the sun, renewable energy can increasingly contribute towards a long-term sustainable energy supply for future generations. This policy further highlights that due to the unlimited resources base of renewable energy in South Africa, renewable energy applications, like PV solar energy and associated infrastructure, are more sustainable in terms of social and environmental costs. The Integrated Resource Planning for Electricity for South Africa of 2010–2030, the National Infrastructure Plan of South Africa and the New Growth Path Framework all support the development of the renewable energy sector. In particular, the IRP also indicated that 43% of the energy generation in South Africa is allocated to renewable energy applications. On a District and Local level limited attention is given explicitly to renewable sources like PV solar energy, however the documents reviewed do make provision for increase energy supply and efficiency in improving the quality of lives in terms of efficient physical infrastructure as well as socio-economic growth. At Provincial, District and Local level the policy documents support the applications of renewables.

The review of the relevant policies and documents related to the energy sector therefore indicate that renewables, like solar energy and the establishment of solar energy facilities and associated infrastructure, are supported on all spheres of Government. The proposed Jersey Solar Power Plant is therefore supported by the related policy and planning documents reviewed in this section of the report.

# 4 THE NEED AND DESIRABILITY

This section aims to address the following requirements of the regulations:

**Appendix 3.** (3) An EIR (...) must include-

(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;

## 4.1 THE NEED FOR THE PROPOSED ACTIVITY

The proposed activity is a direct result of the growing demand for electricity and the need for renewable energy in South Africa. According to Eskom, the demand for electricity in South Africa has been growing at approximately 3% per annum. This growing demand, fuelled by increasing economic growth and social development, is placing increasing pressure on South Africa's existing power generation capacity. Coupled with this, is the growing awareness of environmentally responsible development, the impacts of climate change and the need for sustainable development.

Over 90% of South Africa's electricity generation is coal based, the Word bank estimates that this results in an annual, per capita carbon emission of ~8.9 tons per person. Based on 2008 fossil-fuel CO2 emissions statistics released by the Carbon Dioxide Information Analysis Centre, South Africa is the 13th largest carbon dioxide emitting country in the world and the largest emitter in Africa (Boden, et al. 2011). In August 2021 an article confirmed that South Africa is the 12th highest greenhouse gas emitter in the world (Mashego, P. (n.d.)

The proposed project is intended to form part of the Department of Mineral Resources and Energy's (DMREs) Renewable Energy Independent Power Producer Procurement (REIPPP) Programme or any other appropriate energy generation programmes / opportunities. The REIPPP Programme aims to secure 14 725 Megawatts (MW) of new generation capacity from renewable energy sources, while simultaneously diversifying South Africa's electricity mix. According to the 2021 State of the Nation Address, Government will soon be initiating the procurement of an additional 11 800 MW of power from renewable energy, natural gas, battery storage and coal in line with the Integrated Resource Plan 2019 and fulfilling their commitments under the United Nations Framework Convention on Climate Change and its Paris Agreement which include the reduction of greenhouse gas emissions. Eskom, the largest greenhouse gas emitter of South Africa, has committed in principle to net zero emission by 2050 and to increase its renewable capacity. During the 2022 State of the Nation Address it was indicated that during the past year the government had taken "firm steps" to bring additional generation capacity online as quickly as possible to close the shortfall in terms of electricity. As a result, it was confirmed that several new generation projects will be coming online over the next few years.

Besides capacity additions, several assumptions have changed since the promulgation of IRP 2010–2030. Key assumptions that changed include the electricity demand projection, Eskom's existing plant performance, as well as new technology costs. These changes necessitated the review and update of the IRP which resulted in the draft IRP 2018 as per table 4.1 below:

**Table 4.1:** Published Draft IRP 2018 (Approved by Cabinet for Consultation)

| | Coal | Nuclear | Hydro | Storage (Pumped Storage) | PV | Wind | CSP | Gas / Diesel | Other (CoGen, Biomass, Landfill) | Embedded Generation |
|---|---|---|---|---|---|---|---|---|---|---|
| 2018 | 39 126 | 1 860 | 2 196 | 2 912 | 1 474 | 1 980 | 300 | 3 830 | 499 | Unknown |
| 2019 | 2 155 | | | | | 244 | 300 | | | 200 |
| 2020 | 1 433 | | | | 114 | 300 | | | | 200 |
| 2021 | 1 433 | | | | 300 | 818 | | | | 200 |
| 2022 | 711 | | | | 400 | | | | | 200 |
| 2023 | 500 | | | | | | | | | 200 |
| 2024 | 500 | | | | | | | | | 200 |
| 2025 | | | | | 670 | 200 | | | | 200 |
| 2026 | | | | | 1 000 | 1 500 | | 2 250 | | 200 |
| 2027 | | | | | 1 000 | 1 600 | | 1 200 | | 200 |
| 2028 | | | | | 1 000 | 1 600 | | 1 800 | | 200 |
| 2029 | | | | | 1 000 | 1 600 | | 2 850 | | 200 |
| 2030 | | | 2 500 | | 1 000 | 1 600 | | | | 200 |
| TOTAL INSTALLED | 33 847 | 1 860 | 4 696 | 2 912 | 7 958 | 11 442 | 600 | 11 930 | 499 | 2600 |
| Installed Capacity Mix (%) | 44.6 | 2.5 | 6.2 | 3.8 | 10.5 | 15.1 | 0.9 | 15.7 | 0.7 | |

Installed Capacity
Committed / Already Contracted Capacity
New Additional Capacity (IRP Update)

According to the South African Energy Sector Overview (2021), there is currently 1 723MW of installed PV capacity, while an additional 2 600MW from wind and solar has been rewarded as part of Bid Window 5.

## 4.2 THE DESIRABILITY OF THE PROPOSED ACTIVITY

The facility's contribution towards sustainable development and the associated benefits to society in general is discussed below:

- Lesser dependence on fossil fuel generated power - The deployment of the facility will have a positive macro-economic impact by reducing South Africa's dependence on fossil fuel generated power and assisting the country in meeting its growing electricity demand.
- Increased surety of supply - By diversifying the sources of power in the country, the surety of supply will increase. The power demands of South Africa are ever increasing and by adding solar power this demand can be met, even exceeded without increasing pollution in relation to the use of fossil fuels. The project has the potential of "securing" economic activity by assisting in removing supply constraints if Eskom generation activities result in a supply shortfall. When supply is constrained, it represents a limitation to economic growth. When a supply reserve is available, it represents an opportunity for economic growth.
- Local economic growth - The proposed project will contribute to local economic growth by supporting industry development in line with provincial and regional goals and ensuring advanced skills are drawn to the North West Province. The project will likely encounter widespread support from government, civil society and businesses, all of whom see potential opportunities for revenues, employment and business opportunities locally. The

development of the photovoltaic solar facility will in turn lead to growth in tax revenues for local municipalities and sales of carbon credits, resulting in increased foreign direct investment.

- Lower costs of alternative energy - An increase in the number of solar facilities commissioned will eventually reduce the cost of the power generated through solar facilities. This will contribute to the country's objective of utilising more renewable energy and less fossil fuel-based power sources. It will assist in achieving the goal to generate 14 725 MW of electricity from renewable energy as per the Renewable Energy Independent Power Producer Procurement (REIPPP) Programme of the Department of Mineral Resources and Energy. The Government will be initiating the procurement of an additional 11 800 MW of renewable energy as stated during the 2021 State of the Nation Address.
- Reduction in greenhouse gas emissions - The additional power supplied through solar energy will reduce the reliance on the combustion of fossil fuels to produce power. The South African electricity grid is predominantly coal-fired and therefore Greenhouse Gas (GHG) emissions intensive (coal accounts for more than 92% of the fuel used in South Africa's electricity generation). The reduction of GHG emissions as a result of the project implementation will be achieved due to reduction of $CO_2$ emissions from combustion of fossil fuel at the existing grid-connected power plants and plants which would likely be built in the absence of the project activity.
- CDM Project - A solar energy facility also qualifies as a Clean Development Mechanism (CDM) project (i.e., a financial mechanism developed to encourage the development of renewable technologies).
- Climate change mitigation - On a global scale, the project contributes to greenhouse gas emission reduction and therefore contributes toward climate change mitigation.
- Reduced environmental impacts - The reduction in non-renewable electricity consumed from the grid will not only result in a reduction in greenhouse gas emissions, but also the prevention of negative impacts associated with coal mining. For example, coal power requires high volumes of water, in areas of South Africa where water supply is already over-stretched and water availability is highly variable. Photovoltaic solar energy technology also does not produce the sulphur emissions, ash or coal mining concerns associated with conventional coal fired electricity generation technologies resulting in a relatively low level of environmental impacts. It is a clean technology which contributes toward a better-quality environment for employees and nearby communities.
- Social benefits - The project activity is likely to have significant long-term, indirect positive social impacts that may extend to a regional and even national scale. The larger scale impacts are to be derived in the utilization of solar power and the experience gained through the construction and operation of the power plant. In future, this experience can be employed at other similar solar installations in South Africa.
- Provision of job opportunities - The main benefit of the proposed development operating in the area is that local companies or contractors will be hired for the duration of the construction period. The operational phase will provide permanent job opportunities to the local communities from the surrounding area since security guards and general labourers will be required on a full-time basis. Approximately 800 employment opportunities will be created during the construction phase and 15 - 70 employment opportunities during the operational phase.

- Indirect socio-economic benefits - The increase in the demand for services such as accommodation, transportation, security, general maintenance and catering will generate additional indirect socio-economic benefits for the local community members.
- Increased access to electricity: The national electricity crises of 2010 and the resultant effects on South African residents and the economy has highlighted how highly reliant we are on electricity as a source of energy. Government has committed to developing measures to promote energy saving, reduce energy costs to the economy, and reduce the negative impact of energy use on the environment.
- Cumulative impacts of low to medium significance – No cumulative impacts with a high residual risk have been identified. In terms of the desirability of the development of sources of renewable energy therefore, it may be preferable to incur a higher cumulative loss in such a region as this one, than to lose land with a higher environmental value elsewhere in the country.

# 5 DESCRIPTION OF ENVIRONMENTAL ISSUES

This section aims to address the following requirements of the regulations:

**Appendix 3.** (3) An EIR (...) must include-

(g) A motivation for the preferred development footprint within the approved site (i) details of all the alternatives considered;

(h) a full description of the process followed to reach the proposed development footprint, within the approved site, including –

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

(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;

(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;

(iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;

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

(xi) a concluding statement indicating the preferred alternative development location within the approved site.

## 5.1 CONSIDERATION OF ALTERNATIVES

The DEAT 2006 guidelines on 'assessment of alternatives and impacts' proposes the consideration of four types of alternatives namely, the no-go, location, activity, and design alternatives. It is, however, important to note that the regulation and guidelines specifically state that only 'feasible' and 'reasonable' alternatives should be explored. It also recognizes that the consideration of alternatives is an iterative process of feedback between the developer and EAP, which in some instances culminates in a single preferred project proposal.

An initial site assessment (refer to Appendix D) was conducted by the developer on Portions 1 and 2 of the Farm Illmasdale No. 70 and the project site was found to be favourable since there are no major environmental sensitivities to be avoided and the terrain is flat. The proposed development footprint is also located in close proximity to a powerline route to the existing Pluto MTS. The site is therefore preferred due to its proximity to grid connection options, environmental conditions, relatively flat terrain, high solar radiation values and adequate site access. The site selection also took the site geology, land capability, water availability and land use into consideration before deciding the specific site (Subsolar, 2022).

The following sections explore different types of alternatives in relation to the proposed activity in more detail.

### 5.1.1 No-go alternative

This alternative considers the option of 'do nothing' and maintaining the current status quo of the site, which primarily relates to agricultural use. The description provided in section 5.3 of this report could be considered the baseline conditions (status quo) to persist should the no-go alternative be preferred. The site is currently zoned for agricultural land uses. Should the proposed activity not proceed, the site will remain unchanged and will continue to be used for grazing for game farming (refer to the photographs of the site). The area has limited agricultural potential and is unsuitable for cultivation. The potential opportunity costs in terms of alternative land use income through rental for energy facility and the supporting social and economic development in the area would be lost if the status quo persist.

### 5.1.2 Location alternatives

This alternative asks the question, if there is not, from an environmental perspective, a more suitable location for the project. No other properties have at this stage been secured by Jersey Solar Power Plant (RF) (Pty) Ltd in the Ventersdorp area to potentially establish the solar energy facility. From a local perspective, Portions 1 and 2 of the Farm Illmasdale No. 70, is preferred due to its suitable climatic conditions, topography (i.e., in terms of gradient), environmental conditions (i.e., agricultural potential, ecological sensitivity), proximity to feasible grid connection point options (i.e., for the purpose of electricity evacuation), as well as site access (i.e., to facilitate the movement of machinery, equipment, infrastructure and people during the construction phase).

No alternative areas on Portions 1 and 2 of the Farm Illmasdale No. 70 have been considered for the development footprint, as the area identified and assessed in this Scoping Report does not have major environmental sensitivity and therefore no areas to avoid. Therefore, a single preferred location alternative was assessed – refer to Figure 5.1.

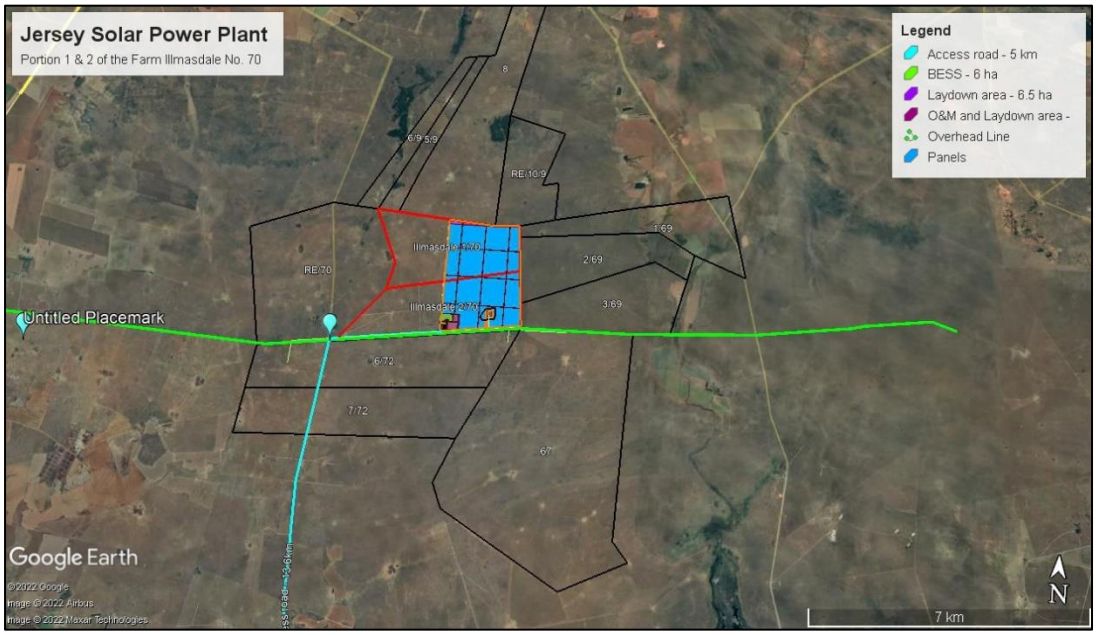


**Figure 5.1**: Location of the single preferred location alternative (i.e., development footprint) located within the affected property assessed.

### 5.1.3 Access Road Alignment Alternatives

The alignment is the route of the road, defined as a series of horizontal tangents and curves. The profile is the vertical aspect of the road, including crest and sag curves, and the straight grade lines connecting them. The bulk (or all) of the access road to the site will be new gravel road construction (existing unsurfaced roadways are located approximately 60m to the south). Furthermore, it is recommended that this road is between 6m and 8m wide. Though there are existing access roads at Alternative 1 and Alternative 2, the intersection with the adjacent D1822 (for the constructed alignment option) will need to be formalised and upgraded to the minimum required standards. The following alignments are proposed for the Jersey SSP.

Alignment Alternative 1 (Preferred)

This proposed alignment alternative is via an existing unsurfaced farm access road located to the west of the site. It should be noted that there is also an existing farm access located immediately south (approximately 10m) of this alignment alternative, on the opposite (western) side of D1822. In comparing the three alignment alternatives, this option was identified as having the greatest offset (alignment) from the proposed access road and requires a horizontal shift of approximately 60m.

Alignment Alternative 2

This proposed alignment alternative is via an existing unsurfaced farm access road located to the west of the site and is north of Alternative 2. There is also an existing farm access located immediately north (approximately 20m) of this alignment alternative, on the opposite (western) side of D1822. In comparison to Alternative 1, this option has a straighter alignment to the proposed access road, although still requires a horizontal shift of approximately 30 m.

Alignment Alternative 3

This proposed alignment alternative will be via a new unsurfaced road located to the west of the site and is north of Alternatives 1 and 2. It should be noted that there is also an existing farm access located north (approximately 50m) of this alignment alternative, on the opposite (western) side of D1822. In comparison to the other two alternatives, this option has the straightest alignment to the proposed access road and does not require a horizontal shift.

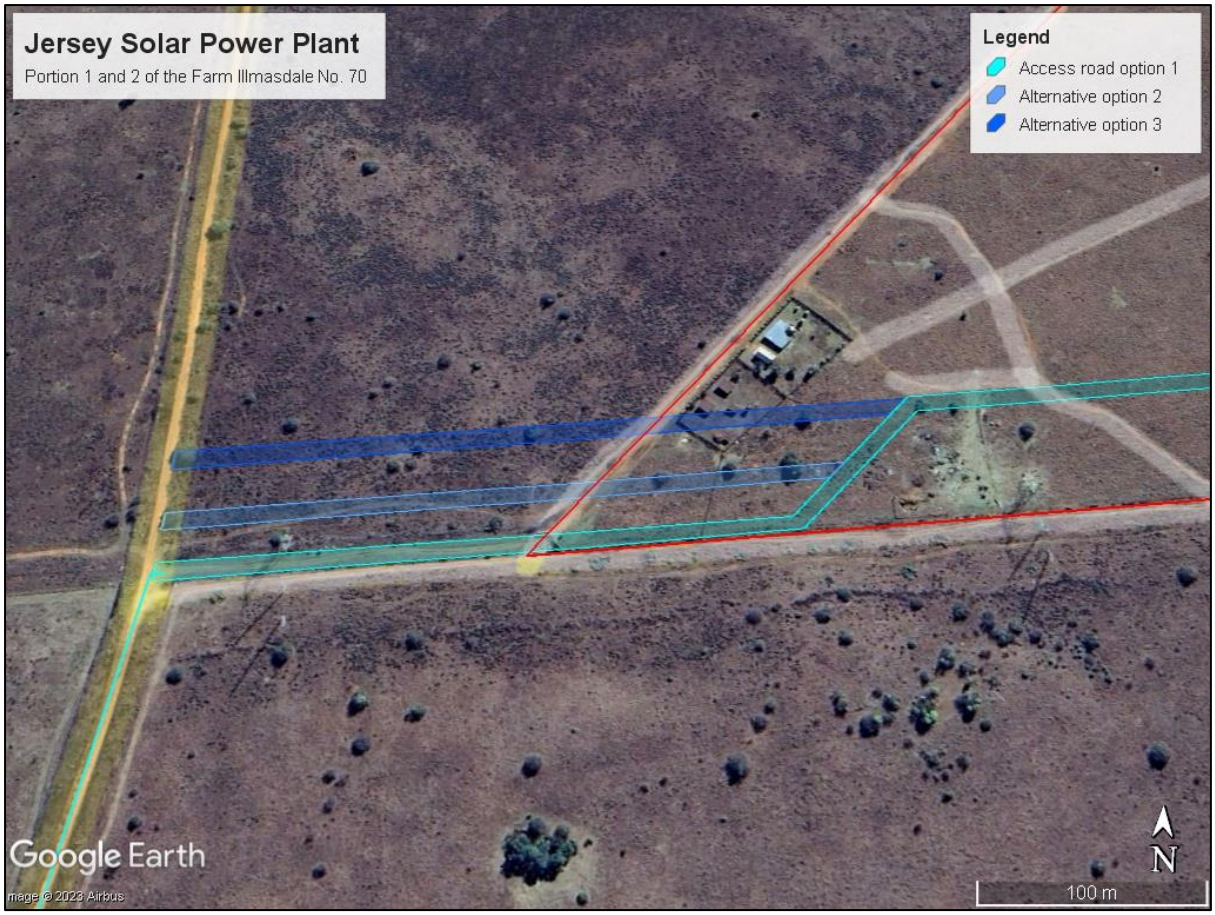



**Figure 5.2**: Proposed site access road and three alignment alternatives

### 5.1.4 Activity alternatives

The EIA process also needs to consider if the development of a solar PV facility would be the most appropriate land use for the particular site.

- Photovoltaic (PV) solar facility – Jeresey Solar Power Plant (RF) (Pty) Ltd is part of a portfolio of solar PV projects throughout South Africa. Jersey Solar Power Plant (RF) (Pty) Ltd is of the opinion that solar PV technology is perfectly suited to the site, given the high irradiation values for of the Louis Trichardt area – refer to Figure 5.3. The technology furthermore entails low visual impacts, have relatively low water requirements, is a simple and reliable type of technology and all the components can be recycled.
- Wind energy facility - Due to the local climatic conditions a wind energy facility is not considered suitable as the area does not have the required wind resource. Furthermore, the applicant has opted for the generation of electricity via solar power rather than the use of wind turbines based on the overall suitability of the site. This alternative is therefore regarded as not feasible and will not be evaluated further in this report.
- Concentrated solar power (CSP) technology - CSP technology requires large volumes of water and this is a major constraint for this type of technology considering the water challenges and limitation experienced not only in the country but also the local area. While the irradiation values are high enough to generate sufficient solar power, the water constraints render this alternative not feasible. It must also be noted that the IRP no longer includes the use of CSP

as part of the energy mix of the country. Therefore, this alternative will not be considered further in this report.

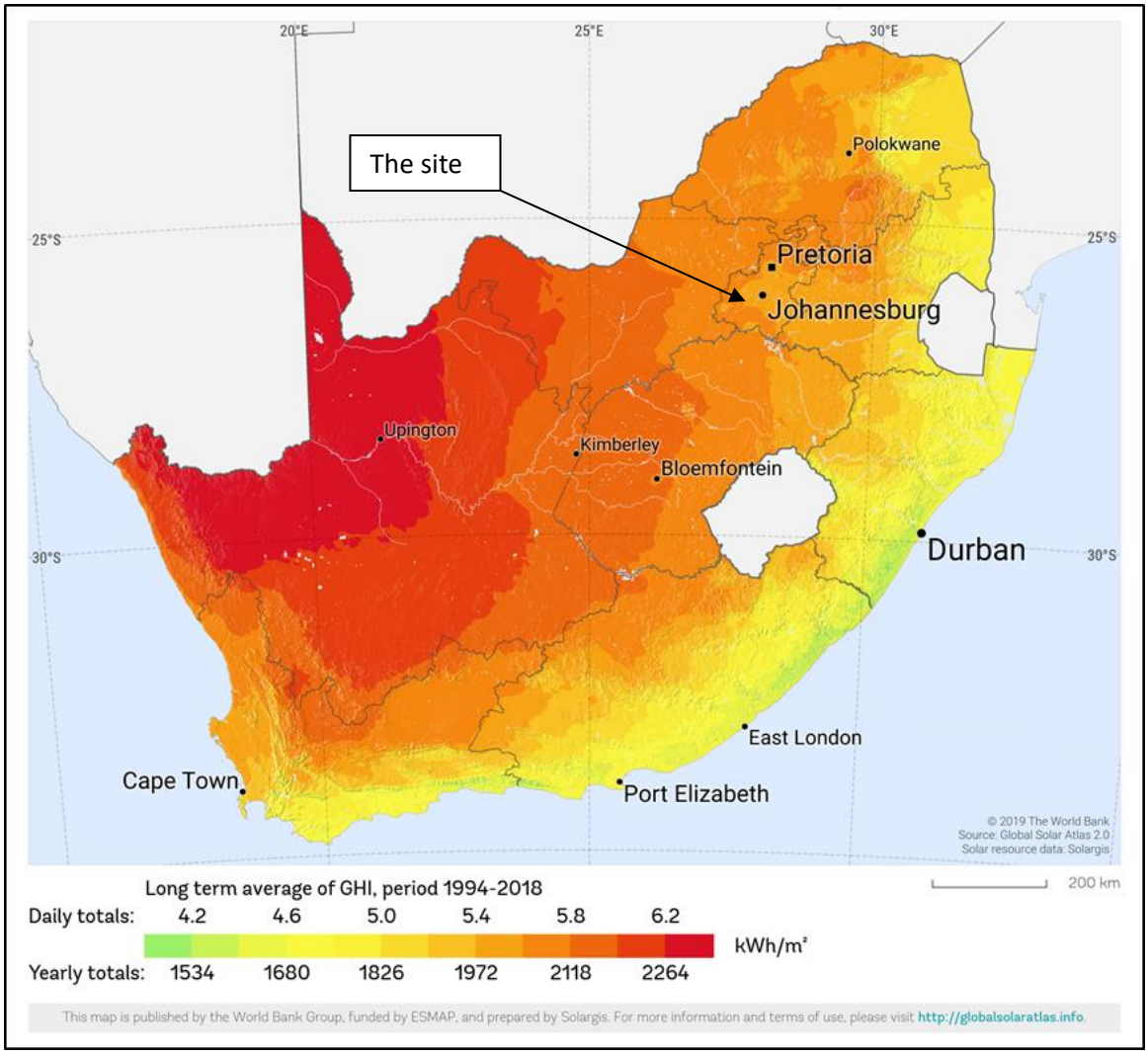



**Figure 5.3:** Global horizontal irradiation values for South Africa (SolarGIS, 2021) and the Jersey Solar Power Plant.

### 5.1.5 Technical alternatives

Possible technical alternatives for the development of a solar PV facility needs to be considered during the EIA process.

#### 5.1.5.1 Distribution lines

It is expected that generation from the facility will connect to the national grid via the existing Eskom Hera / Watershed 275kV HV Feeder Overhead Line to the existing Eskom Pluto 400kV/275KV/22KV MTS Substation or Pluto Watershed 275kV Overhead Line. The grid connection route has been assessed within a 200m wide (up to 550m wide in some instances) corridor. The Project will inject up to 350MW into the National Grid. The installed capacity will be approximately 415MW.

A 132kV overhead distribution line is the only preferred alternative for the applicant due to the following reasons:

- **Overhead Distribution Lines** - Overhead lines are less costly to construct than underground lines. Therefore, the preference for overhead lines is mainly based on cost. Overhead lines allow high voltage operations, and the surrounding air provides the necessary electrical insulation to earth. Further, the surrounding air cools the conductors that produce heat due to lost energy (Swingler et al, 2006).

  The overall weather conditions in the North West Province are unlikely to cause damage and faults on the proposed overhead distribution power line. Nonetheless, if a fault occurs, it can be found quickly by visual means using a manual line patrol. Repair to overhead lines is relatively simple in most cases and the line can usually be put back into service within a few days. In terms of potential impacts associated with overhead distribution lines these include visual intrusion and threats to sensitive habitat (where applicable).

  Furthermore, overhead power lines also provides an opportunity for the avoidance of sensitive environmental features as the overhead lines can span on-ground environmental features to ensure conservation, therefore providing more flexibility in terms of mitigation of the associated on-ground disturbance.

  The choice of structure to be used for the power line will be determined in consultation with Eskom once the Engineers have assessed the geotechnical and topographical conditions of the route and decided on a suitable structure which meets the prescribed technical requirements. The choice of structures to be used will not have any adverse impacts on the environment, and the independent specialists, of various fields of study, have considered the development of the power line and recommended appropriate mitigation measures where required. The line will be constructed according to the authorised standards for a power line approved by Eskom Holdings SoC Ltd.

The following alternatives may be considered for the overhead power line:

- Single Circuit Overhead Power Line - The use of single circuit overhead power lines to distribute electricity is considered the most appropriate technology and has been designed over many years for the existing environmental conditions and terrain as specified in the Eskom Specifications and best international practice. Based on all current technologies available, single circuit overhead power lines are considered the most environmentally practicable technology available for the distribution of power. This option is considered appropriate for the following reasons:
  - More cost-effective installation costs;
  - Less environmental damage during installation; and
  - More effective and cheaper maintenance costs over the lifetime of the power line.

- Double Circuit Overhead Power Line - Where sensitive environmental features are identified, and there is sufficient justification, Eskom will consider the use of double circuit (placing 2 power lines on either side of the same tower structure) to minimise impacts. However, the use of double-circuiting has a number of technical disadvantages:

- Faults or problems on one power line may mean that the other power line is also disabled during maintenance, and this will affect the quality of supply to an area. Larger and taller towers as well as more towers are required for double-circuit power lines.

The double-circuit overhead power line proves more feasible since the single circuit may not have the capacity to transmit the large amount of electricity generated from the plant and during maintenance the entire plant would not have to be offline as one of the double circuit lines would still be able to supply electricity. However, due to the rapid requirement changes, this will only be determined before construction.

- **Underground Distribution Lines** - Underground cables have generally been used where it is impossible to use overhead lines (for example due to space constraints). Underground cables are oil cooled and are also at risk of groundwater contamination. Maintenance is also difficult on underground lines compared to overhead lines. When a fault occurs in an underground cable circuit, it is almost exclusively a permanent fault due to poor visibility. Underground lines are also more expensive to construct than overhead lines.

#### 5.1.5.2 Battery Energy Storage Facility (BESS)

It is proposed that a Battery Energy Storage Facility for grid storage would be housed in stacked containers, or a multi-storey building, with a maximum height of 8m and a maximum volume of 1,740m$^3$ of batteries and associated operational, safety and control infrastructure. Three types of battery technologies are being considered for the proposed project: Lithium-ion, Sodium-sulphur or Vanadium Redox flow battery. While there are various battery storage technologies available, the preferred alternative is the utility-scale Lithium-ion (Li-ion) battery energy storage. Li-ion batteries have emerged as the leading technology in utility-scale energy storage applications because it offers the best mix of performance specifications, such as high charge and discharge efficiency, low self-discharge, high energy density, and long cycle life (Divya KC et al., 2009).

Battery storage offers a wide range of advantages to South Africa including renewable energy time shift, renewable capacity firming, electricity supply reliability and quality improvement, voltage regulation, electricity reserve capacity improvement, transmission congestion relief, load following and time of use energy cost management. In essence, this technology allows renewable energy to enter the base load and peak power generation market and therefore can compete directly with fossil fuel sources of power generation and offer a truly sustainable electricity supply option.

### 5.1.6 Design and layout alternatives

Design alternatives were considered throughout the planning and design phase (i.e., what would be the best design option for the development?). In this regard discussions on the design were held between the EAP and the developer, which also included the consideration of sensitive environmental areas and features present as identified by the independent specialists that needs to be avoided by the placement of infrastructure. The draft layout plan is included as Appendix H, but it should be noted that the final layout plan will be submitted as part of the EIA Report.

The draft layout follows the limitations of the site, however no environmental sensitive areas (supported by specialist input) were identified that required avoidance apart from fences and

servitudes. The total surface area proposed for layout options include the PV panel arrays spaced to avoid shadowing, access and maintenance roads and associated infrastructure (buildings, power inverters, power lines, BESS and perimeter fences). With regards to the structure orientation, the panels will either be fixed to a single-axis horizontal tracking structure where the orientation of the panel varies according to the time of the day, as the sun moves from east to west or tilted at a fixed angle equivalent to the latitude at which the site is located in order to capture the most sun.

The choice of pylon structure to be used for the power line will be determined in consultationwith Eskom and does not significantly affect the environmental impacts of the proposed development as provision has already been made for the visual, ecological and heritage impacts of erecting a power line. No defined structure has been confirmed at this stage and will depend on Eskom's technical requirements. The 132kV line must be constructed accordingto the authorised standards for a power line approved by Eskom Holdings SoC Ltd. The structure to be utilised for the power line towers will also be informed by the local geotechnical and topographical conditions. The following alternatives are considered with regards to the proposed structures:

#### 5.1.6.1 Steel lattice towers:

The steel lattice towers provide the following advantages over the other tower types available:

- Enables multipath earthing which enhances the overall electrical performance ofthe power line.
- Is visually less obtrusive than the mono-pole options.
- Is more practicable that other options i.e. more cost effective and more practicalto construct and maintain.
- Is safer to work on than the monopole and wood pole structures.
- Is more durable than the wood pole structures.Steel monopoles:

The steel monopole is considered less suitable than the steel lattice towers for the followingreasons:

- Is visually more intrusive than the lattice towers.
- Is more expensive than the lattice towers.
- Requires more steel than the lattice towers.
- Is more difficult to erect.
- Is not as safe to work on as the lattice towers.Wood poles:

Wood pole structures are only used in extreme circumstances where a visual impact needs tobe avoided. Wood pole structures may be cheaper to produce and to construct, but they haveone tenth of the lifespan of the metal counterparts and are far more susceptible to weather conditions which makes them less efficient and practicable. The wood pole structure is also more susceptible to having the cross arms burnt off by electrical faults as well as being susceptible to deformation with height.

### 5.1.7 Technology alternatives

There are several types of semiconductor technologies currently available and in use for PV solar panels. Two, however, have become the most widely adopted, namely crystalline silicon, thin film or bifacial PV panels. These technologies are discussed in more detail below:

#### 5.1.7.1 Crystalline (high efficiency technology at higher cost):

Crystalline silicon panels are constructed by first putting a single slice of silicon through a series of processing steps, creating one solar cell. These cells are then assembled together in multiples to make a solar panel. Crystalline silicon, also called wafer silicon, is the oldest and the most widely used material in commercial solar panels. Crystalline silicon modules represent 85-90% of the global annual market today. There are two main types of crystalline silicon panels that can be considered for the solar facility:

- Mono-crystalline Silicon - mono-crystalline (also called single crystal) panels use solar cells that are cut from a piece of silicon grown from a single, uniform crystal. Mono-crystalline panels are among the most efficient yet most expensive on the market. They require the highest purity silicon and have the most involved manufacturing process.

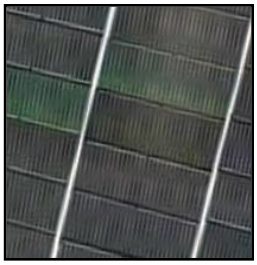
- Poly-crystalline Silicon – poly-crystalline panels use solar cells that are cut from multifaceted silicon crystals. They are less uniform in appearance than mono-crystalline cells, resembling pieces of shattered glass. These are the most common solar panels on the market, being less expensive than mono-crystalline silicon. They are also less efficient, though the performance gap has begun to close in recent years (First Solar, 2011)

#### 5.1.7.2 Thin film (low-cost technology with lower efficiency):

Thin film solar panels are made by placing thin layers of semiconductor material onto various surfaces, usually on glass. The term *thin film* refers to the amount of semiconductor material used. It is applied in a thin film to a surface structure, such as a sheet of glass. Contrary to popular belief, most thin film panels are not flexible. Overall, thin film solar panels offer the lowest manufacturing costs, and are becoming more prevalent in the industry. Thin films currently account for 10-15% of global PV module sales. There are three main types of thin film used:

- Cadmium Telluride (CdTe) - CdTe is a semiconductor compound formed from cadmium and tellurium. CdTe solar panels are manufactured on glass. They are the most common type of thin film solar panel on the market and the most cost-effective to manufacture. CdTe panels perform significantly better in high temperatures and in low-light conditions.

- Amorphous Silicon - Amorphous silicon is the non-crystalline form of silicon and was the first thin film material to yield a commercial product, first used in consumer items such as calculators. It can be deposited in thin layers onto a variety of surfaces and offers lower costs than traditional crystalline silicon, though it is less efficient at converting sunlight into electricity.



- Copper, Indium, Gallium, Selenide (CIGS) - CIGS is a compound semiconductor that can be deposited onto many different materials. CIGS has only recently become available for small commercial applications and is considered a developing PV technology (First Solar, 2011).

#### 5.1.7.3 Bifacial panels:

As the name suggests, bifacial solar panels have two faces, or rather, they can absorb light from both sides of the panel. A lot of potential energy transfer is lost in traditional solar cells when the light hits the back of a solar panel. Most bifacial solar panels use monocrystalline cells, whereas traditional cells use polycrystalline materials. The monocrystalline materials, alongside the clear light pathway on both sides of the panel, enable the light to be absorbed from either side of the cell, and it is thought that the overall efficiency of these cells can be up to 30% greater in commercial applications. Although, the exact amount is variable depending on the surface that they are installed on. The front side of the solar panel still absorbs most of the solar light, but the back side of the solar panel can absorb between 5-90% of the light absorbed by the front of the solar panel.

Traditional solar panels use an opaque back sheet. By comparison, bifacial solar panels either have a clear/reflective back sheet or have dual panes of glass. Most of these solar panels are frameless so any issues with potential-induced degradation (PID) are reduced. To efficiently convert light into electricity from both sides, bifacial solar cells have selective-area metallization schemes that enable light to pass between the metallized areas, rather than the conventional thick metal collectors as seen with monofacial solar panels.

The technology that (at this stage) proves to be most feasible and reasonable with respect to the proposed solar facility is crystalline silicon panels, due to it being non-reflective, more efficient, and

with a higher durability. However, due to the rapid technological advances being made in the field of solar technology the exact type of technology to be used, such as bifacial panels, will only be confirmed at the onset of the project.

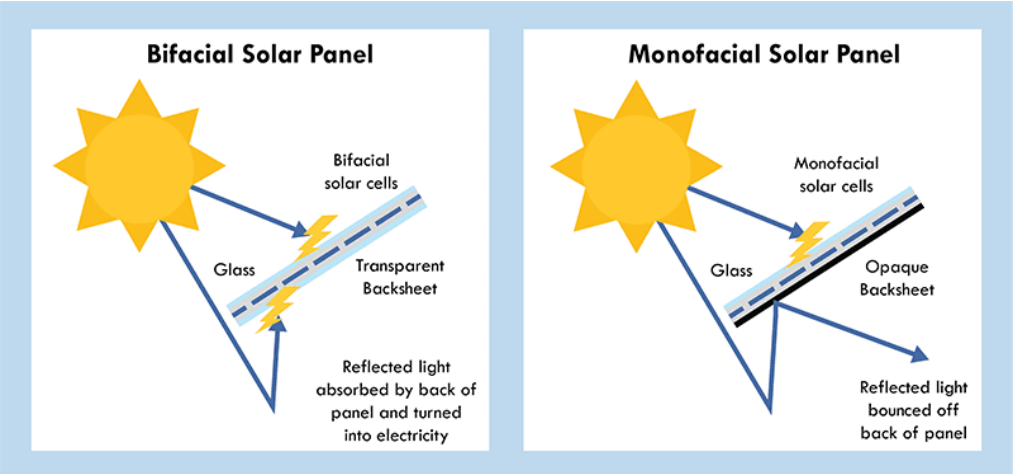



**Figure 5.4:** Bifacial vs Monofacial Solar Panel absorption.

## 5.2 PUBLIC PARTICIPATION PROCESS

The following sections provide detailed information on the public participation process conducted in terms of Regulations 39 to 44. The approved public participation plan is also included as Appendix J to the report.

### 5.2.1 General

The public participation process was conducted strictly in accordance with Regulations 39 to 44. The following three categories of variables were taken into account when deciding the required level of public participation:

- The scale of anticipated impacts
- The sensitivity of the affected environment and the degree of controversy of the project
- The characteristics of the potentially affected parties

Since the scale of anticipated impacts is low, the low environmental sensitivity of the site and the fact that no conflict was foreseen between potentially affected parties, no additional public participation mechanisms were considered at this stage of the process. The following actions have already been taken in line with the approved public participation plan (refer to Appendix J):

➢ Newspaper advertisement

Since the proposed development is unlikely to result in any impacts that extend beyond the municipal area where it is located, it was deemed sufficient to advertise in a local newspaper. An advertisement was placed in English in the local newspaper (Potchefstroom Herald) on the 29 September 2022 (see Appendix C2) notifying the public of the EIA process and requesting Interested and Affected Parties

(I&APs) to register with and submit their comments to Environamics Environmental Consultants. I&APs were given the opportunity to raise comments within 30 days of the advertisement (by 30 October 2022).

- Site notices

Site notices were placed on site in Afrikaans and English on 29 September 2022 to inform surrounding communities and immediately adjacent landowners of the proposed development. I&APs were given the opportunity to raise comments by 30 October 2022. Photographic evidence of the site notices is included in Appendix C3.

- Direct notification of identified I&APs

Identified I&APs, including key stakeholders representing various sectors, has been directly informed of the EIA process on 03 October 2022 via WhatsApps and emails (as relevant). The Background Information Document (BID) was distributed with the notification. For a complete list of I&APs with their contact details see Appendix C4 to this report. It was expected from I&APs to provide their inputs and comments by 4 November 2022. To date comments have been received from various parties that have an interest in the development (Appendix C5 – C7).

- Direct notification of surrounding landowners and occupiers

Written notices were also provided via registered post, WhatsApp or email (as relevant) to all surrounding landowners and occupiers on 03 October 2022. The surrounding landowners were given the opportunity to raise comments within 30 days. For a list of surrounding landowners see Appendix C4. The surrounding landowners were given the opportunity to raise comments by 04 November 2022. To date comments have been received from various parties that have an interest in the development (refer to Appendix C5 – C7). Refer to Figure 5.6

- Circulation of Draft Scoping Report

Copies of the draft Scoping report was provided to all I&APs via courier, Dropbox and/or email (as relevant). Hard copies of the report have been made available on request and where an I&AP did not have the resources to view the report on an online platform. I&AP's and organs of state were requested to provide their comments on the report from 12 December 2022 until 02 February 2023. All issues identified during the 30-day review and comment period have been recorded, documented and compiled into a Comments and Response Report included as part of the Final Scoping Report for decision-making.

- Circulation of the Draft Environmental Impact Assessment Report

All registered I&APs and State Department were informed of the availability of the Draft EIR on 03 April 2023 and requested to provide their comments within 30 days (refer to Appendix E). The 30-day review and comment period was from 03 April 2023 to 08 May 2023 (excl. public holidays). All comments received as part of the public participation process have been included in the Comment and Responses report. The Comments and Responses report is included as Appendix C7 of this final EIR.

- Circulation of decision and submission of appeals:

Notice will be given to all identified and registered I&APs of the decision taken by the DFFE on the Application for EA. The attention of all registered I&APs will also be drawn to the fact that an appeal may be lodged against the decision in terms of the National Appeals Regulations. In accordance with the provisions of Regulation 4(1) of Government Notice No. 993, an appellant must submit the appeal to the appeal administrator, and a copy of the appeal to the applicant, any registered I&APs and any organ of state with interest in the matter within 20 days from the date that the notification of the decision was sent to the applicant by the competent authority.

### 5.2.2 Consultation process

Regulation 41 requires that the municipality, relevant ward councillor and any organ of state having jurisdiction in respect of any aspect of the activity should be given written notice of the activity. A complete list of all the consultees who received written notice as well as proof of correspondence is attached as Appendix C.

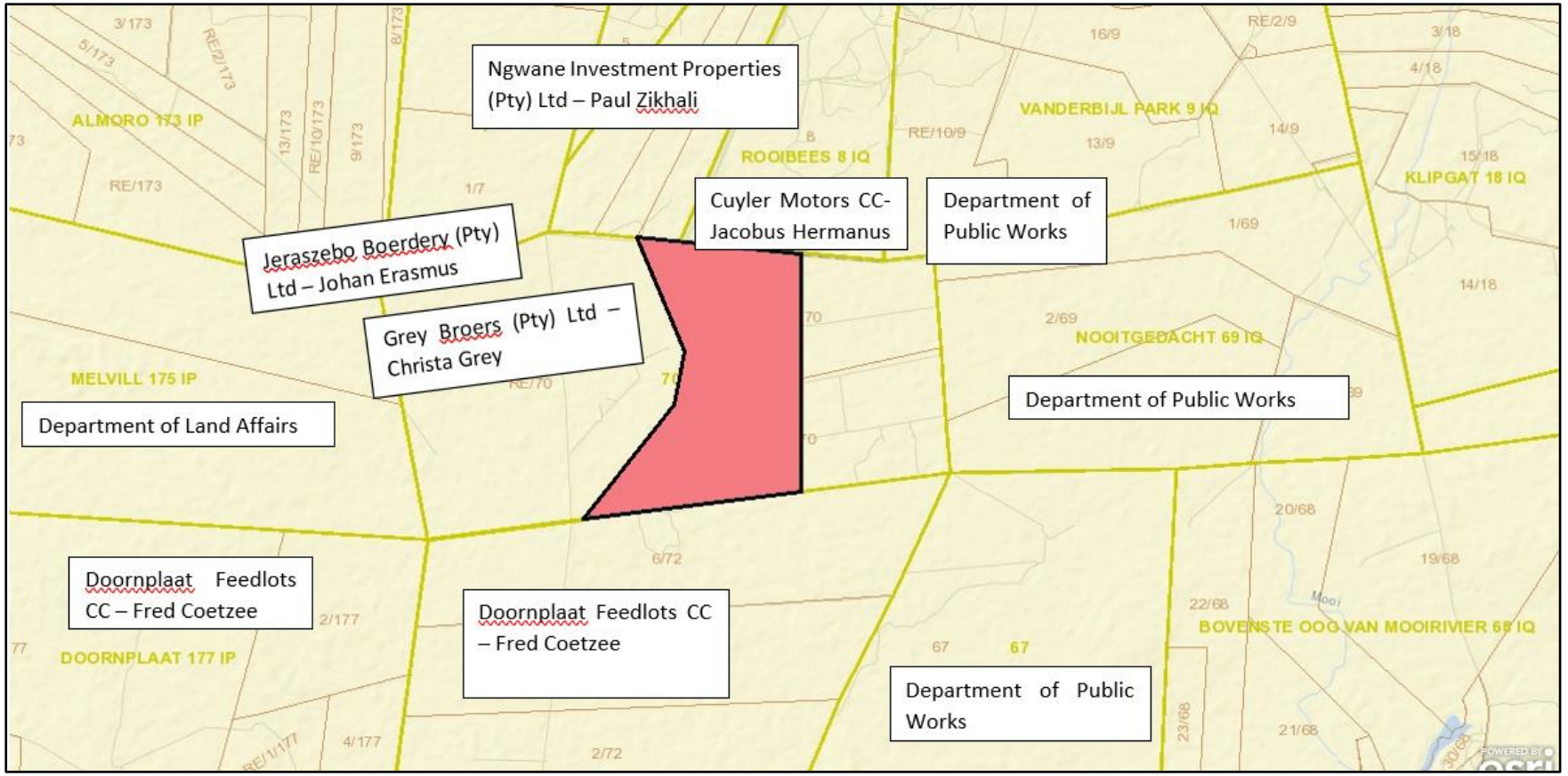



**Figure 5.5**: Surrounding Landowners

### 5.2.3 Registered I&APs

I&APs include all stakeholders who deem themselves affected by the proposed activity. According to Regulation 43(1) "A registered interested and affected party is entitled to comment, in writing, on all reports or plans submitted to such party during the public participation process contemplated in these Regulations and to bring to the attention of the proponent or applicant any issues which that party believes may be of significance to the consideration of the application, provided that the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application."

This report is the Final Environmental Impact Report. The Draft Environmental Impact Report has was made available to all potential and/or registered I&APs and State Departments. They were provided with a copy of the Draft EIR and were requested to provide written comments on the report within 30 days. All issues identified during this review period, and previous review periods (i.e. Scoping Phase), have been documented and compiled into a Comments and Response Report included as part of the Final EIR (Appendix C7).

All comments received during the Scoping Phase, and during the 30-day review and comment period have also been included in this Final report as Appendix C.

### 5.2.4 Issues raised by I&APs and consultation bodies

Comments from the DFFE Directorate: Biodiversity and Conservation and SAHRA have been received. All comments received during the circulation of the draft Scoping Report and draft environmental impact report have been included in the comments and responses report included as part of this final EIR. The full wording and original correspondence are included in Appendix C6 of the Final EIR.

## 5.3 THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE PREFERRED ALTERNATIVE

The following sections provide general information on the biophysical and socio-economic attributed associated with the preferred alternative (i.e. the location of the development footprint within the affected property).

### 5.3.1 Biophysical environment

The biophysical environment is described with specific reference to geology, soils, agricultural potential, vegetation and landscape features, climate, biodiversity and the visual landscape. A number of specialists were consulted to assist with the compilation of this chapter of the report – refer to the Table 1.2. However, due to the fact that the area proposed for development (i.e. the development footprint) exclusively consists of land used for grazing and limited sensitive areas exist on site. These features are described in more detail below. These features are described in more detail below.

#### 5.3.1.1 Agriculture and Soil

According to the Agricultural Compliance Statement (attached in Appendix E4) the project assessment area footprint falls within the Fa 16 land type. The Fa 16 land type is mostly predominated by Hutton, Glenrosa and Mispah soil forms with also the occurrence of bare rocky areas and other associated soils also occurring throughout the terrains, following the South African soil classification working

group (1990). The Fa land types are characterised with shallow profiles and occurrence of rocky areas. Lime is rare or absent in the entire landscape.

The Palaeontological Impact Assessment (refer to Appendix E6) has indicated that Jersey SPP underlain by the Precambrian dolomites and associated marine sedimentary rocks of the) of the Monte Christo Formation (Malmani Subgroup, Chuniespoort Group, Transvaal Supergroup). Updated geology (Council of Geosciences, Pretoria) indicates that the Malmani Subgroup is represented in the Jersey SPP footprint. A High Palaeontological Sensitivity to the Malmani Subgroup due to the presence of stromatolites.

The most sensitive soil forms identified within the project area is the Vaalbos and Hutton soil forms. The land capability sensitivities (DAFF, 2017) indicate land capabilities with “Very Low to Moderate” sensitivities, which correlates with the findings from the baseline assessment (refer to figure 5.7 for the land capability map indicating the most intensive long-term sustainable use of land under rain-fed conditions at the proposed site). The overall sensitivity of the assessment area is categorized as “low” which also conforms to the DFFE (2022) agricultural sensitivity themes.

The project area is associated with non-arable lands. The available climate limits crop production significantly. The harsh climatic conditions are associated with low annual rainfall and high evapotranspiration potential demands of the area, which consequently result into a very restricted choice of crops due to the heat and moisture stress. The area is not favourable for most cropping practices, which corresponds to the current livestock and game farming activities in the area.

It is the specialist’s opinion that the proposed Jersey SPP project and associated infrastructure will have limited impacts on the agricultural production ability of the land. There is no segregation of any crop fields with a high production capability within the project assessment area. It is, therefore, the specialist`s recommendation that the proposed Jersey SPP project and associate infrastructure may be favourably considered for development with no significant impacts expected to occur. And therefore, no specific mitigation measures are required to be implemented.

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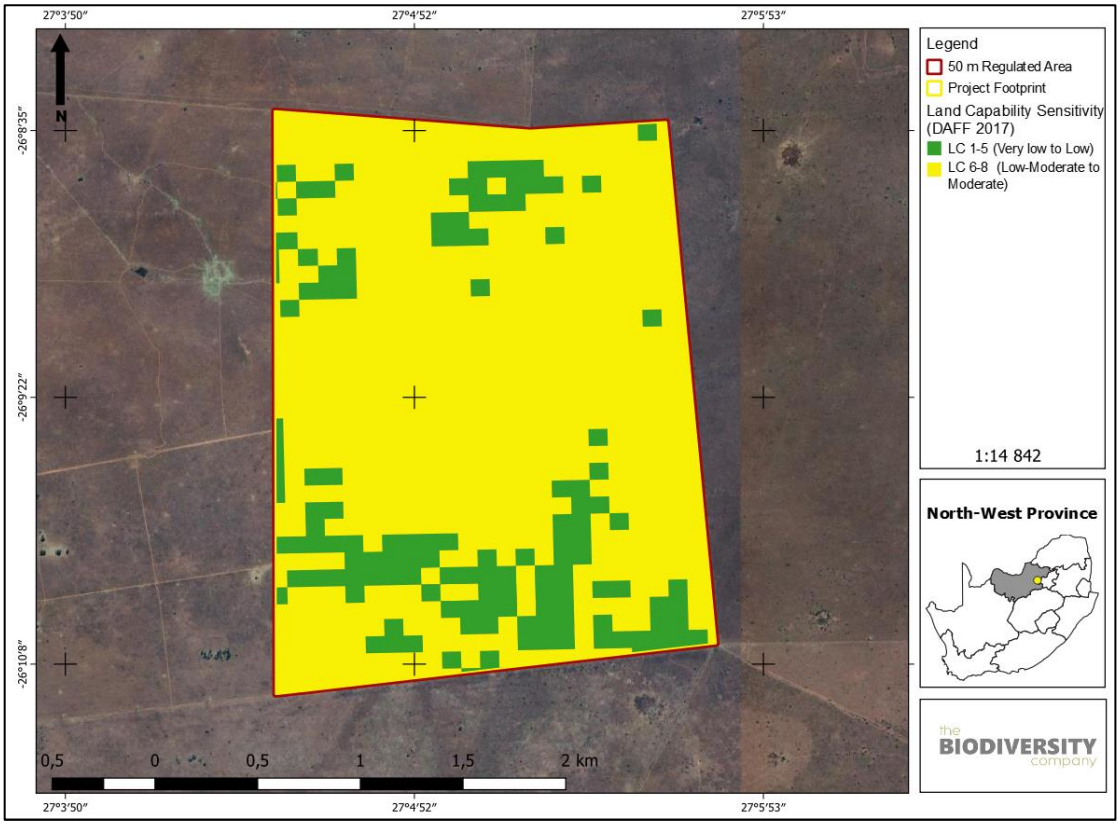


**Figure 5.6**: Land Capability Sensitivity Map

### 5.3.1.2 Biodiversity, Vegetation and, topography and landscape feature

The Terrestrial Biodiversity Compliance Statement (Appendix E1) state that the majority of the project area comprised of grassland, which has been impacted upon by anthropogenic. No Species of Conservation Concern (SCC) flora species were recorded, however, *Euphorbia inaequilatera* (Gladde Rooiopslag) was recorded along the project area and is protected under Schedule 2 of the North West Biodiversity Management Act No 4 (2016).

Two fauna Species of Conservation Concern (SCC) were recorded, *Hippotragus niger* (Sable Antelope) and *Equus quagga* (Plains Zebra), which are considered to be introduced to the area since some surrounding portions of the project area is utilised as a game farm.

Completion of the terrestrial biodiversity assessment led to a disputing of the 'Very High' classification for the terrestrial biodiversity theme sensitivity as allocated by the National Environmental Screening Tool. The project area is instead assigned an overall sensitivity of 'Medium' and 'Very Low'.

Vegetation Units:

The vegetation unit type found at the study area is Carletonville Dolomite Grassland (refer to Figure 5.7 indicating vegetation unit type at the study area). This vegetation type occurs on slightly undulating plains dissected by prominent rocky chert ridges. Species-rich grasslands forming a complex mosaic pattern dominated by many species (Mucina & Rutherford, 2006). This vegetation type occurs in the North-West, Gauteng and marginally into the Free State Province. In the region of Potchefstroom, Ventersdorp and Carletonville, extending westwards

to the vicinity of Ottoshoop, but also occurring as far east as Centurion and Bapsfontein in Gauteng Province.

Conservation Status of the vegetation type

According to Mucina and Rutherford (2006), this vegetation type is classified as Vulnerable (VU). The national target for conservation protection for both these vegetation types is 24%, but only a small extent is conserved in statutory (Sterkfontein Caves — part of the Cradle of Humankind World Heritage Site, Oog Van Malmanie, Abe Bailey, Boskop Dam, Schoonspruit, Krugersdorp, Olifantsvlei, Groenkloof) and in at least six private conservation areas. Almost a quarter of this vegetation already transformed for cultivation, by urban sprawl or by mining activity as well as the building of the Boskop and Klerkskraal Dams.

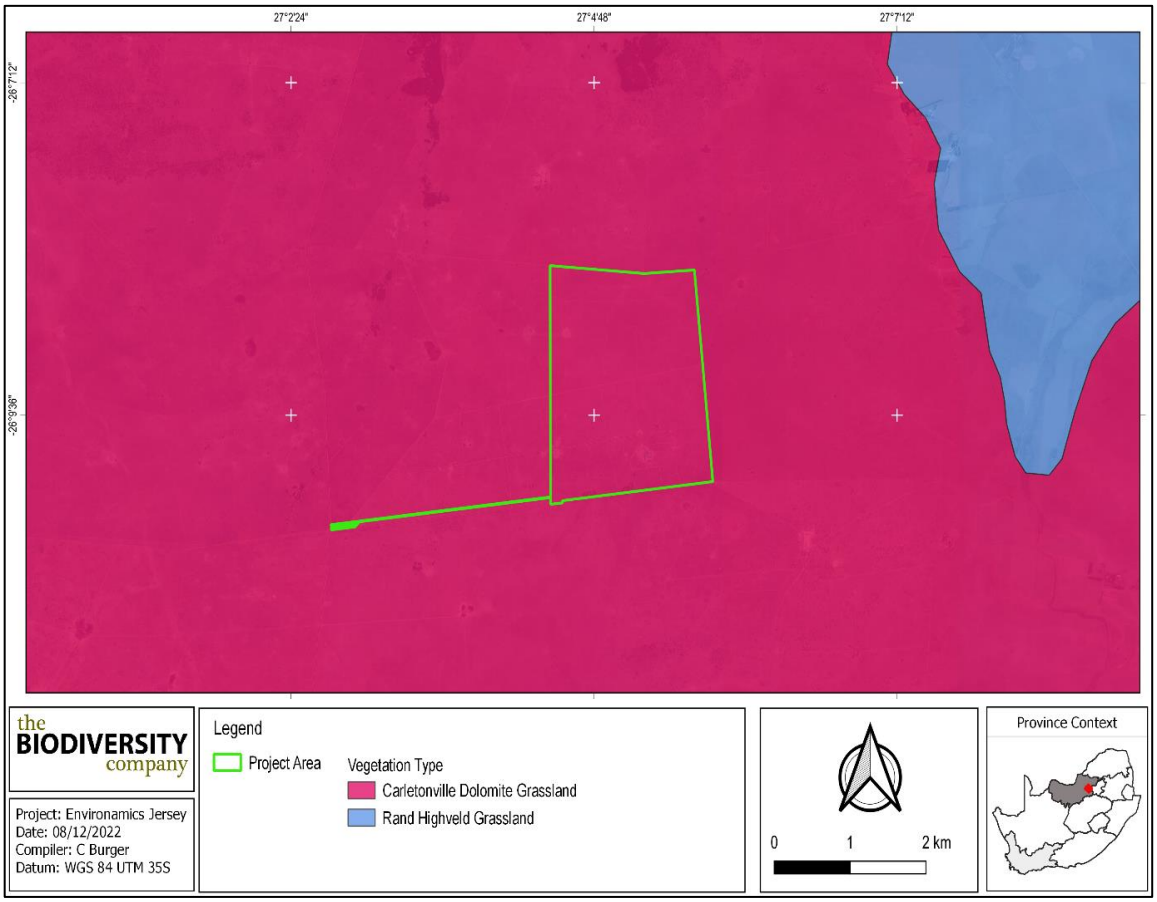


**Figure 5.7:** Vegetation units present within the Jersey Solar Power Plant development footprint

*Protected Areas, Critical Biodiversity Areas (CBA) and Ecological Support Areas (ESA)*

According to the 2015 North West CBA and ESA map dataset the project area overlaps with ESA1 areas. It should be explained here that the site falls within a NPAES and that the site is 5km from a nature reserve (refer to figure 5.8 for the proximity of the natura reserve to the study area).

CBAs are areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and healthy functioning of important species and ecosystems and the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then provincial biodiversity targets cannot be met (SANBI, 2017).

ESAs are areas that are not essential for meeting biodiversity representation targets but play an important role in supporting the ecological functioning of ecosystems as well as adjacent Critical Biodiversity Areas, and/or in delivering ecosystem services that support socio-economic development (SANBI, 2017).

*Species of Conservation Concern*

Based on the Plants of Southern Africa (BODATSA-POSA, 2019) database, over 460 plant species have the potential to occur within the project area and its surroundings. Of these species, three are listed as being an SCC. The species are highlighted in the table 5.1 below:

**Table 5.1:** Floral Species of Conservation Concern

| Family | Taxon | National Red-List (SANBI, 2016a) | IUCN | Ecology | Likelihood of Occurrence |
|---|---|---|---|---|---|
| **Asteraceae** | *Gnaphalium nelsonii* | NT | NT | Indigenous; Endemic | Moderate |
| **Fabaceae** | *Indigofera hybrida* | VU | VU | Indigenous; Endemic | Low |
| **Cleomaceae** | *Cleome conrathii* | NT | NT | Indigenous | Moderate |

#### 5.3.1.3 Wetlands and riparian features

The proposed solar project is located approximately 27 km northeast of Ventersdorp in the North West province and approximately 49km southwest of Boons. The project area is situated in the C23F quaternary catchment within the Vaal Water Management Area (WMA) (refer to figure 5.9).

During the site visit, no wetlands were identified within the proposed site. The project area is characterised by Vaalbos and Hutton soil forms, with other associated soils also occurring in the assessment footprint area. The Hutton soil form consists of an orthic topsoil horizon on top of a thick red apedal subsurface diagnostic horizon. The Vaalbos soil form consist of an orthic topsoil on top of a red apedal horizon underlain with a hard-rock substratum below. These soils will not be present within wetlands.

#### 5.3.1.4 Climate

The project area is characterised by a warm-temperate summer rainfall with an overall mean annual precipitation of approximately 593mm (Mucina & Rutherford, 2006). Severe frost frequently occurs within winter months with high temperatures within the summer months.

#### 5.3.1.5 Biodiversity

The following sections discuss the state of biodiversity on the site in more detail.

Avifaunal

According to the Avifauna Scoping Assessment (Appendix E2) the proposed Jersey Solar Power Plant project area is sensitive with a moderate to high likelihood of species of conservation concern occurring. This assumption is based on the ESA1 classification of the area as well as the proximity to priority focus areas. The project area does not overlap with any wetlands or rivers, the closest river being the Mooi River, which is 4 km east of the project area and the closest wetland is 900 m to the west. The resident avifauna is represented by relatively low to moderate species richness and abundance. A good baseline dataset was generated during the site surveys, supplemented by a meagre SABAP2 dataset.

There are Red Data species that could possibly occur on site, even as vagrants and the likelihood of their occurrence must be assessed. The potential red data species for the site, along with probability estimates and notes are presented. No Red Data species were recorded during the surveys, although suitable habitat does exist on site for the following species:

- European Roller- Near threatened. Not recorded in the pentads or during the site visit but based on the suitable habitat in the project area the likelihood of occurrence is rated as high.
- Saddle-billed Stork- Endangered. Not recorded in the pentads or during the site visit, very low likelihood of occasionally occurring on site.
- White-bellied Korhaan- Vulnerable. Not recorded in the pentads or during the site visit but habitat on site appears suitable area, thus likelihood of occurrence is rated as moderate.
- Lanner Falcon- Vulnerable. Not recorded in the pentads or during the site visit. The likelihood of occurrence for this species in the project area is rated as high due to the suitable habitat.
- Black-winged Pratincole- Near Threatened. Not recorded in the pentads or during the site visit. Habitat suitability is marginal on the SPP site, but the likelihood of its occurrence is low.
- Blue Crane- Near-Threatened. Not recorded in the pentads or during the site visit. although not ideal habitat the species has a moderate likelihood of occurrence.
- White-backed Vulture- Critically Endangered. Not recorded in the pentads or during the site visit. The presence of open savannas within the project area contributed to a high likelihood of occurrence for this species
- Cape Vulture- Endangered. Not recorded in the pentads or during the site visit. Suitable food at the nearby reserves increases the likelihood of occurrence and it is rated as high.
- Melodious Lark- Least concern. Not recorded in the pentads or during the site visit. This species has a moderate likelihood of occurring in the project area.

- Yellow-billed Stork- Endangered. Not recorded in the pentads or during the site visit. Habitat suitability is marginal on the SPP site, but the likelihood of its occurrence is low.

- Secretary bird- Vulnerable. Not recorded in the pentads or during the site visit but the likelihood of occurrence for this species is rated as high due to the open areas present in the project area.

All of the endemic or near-endemic species listed above that have either been confirmed as occurring on site during this assessment or during past SABAP2 assessments have wide distributional ranges and reportedly healthy populations and should not present and substantial threats as a result of development of this site.

Fauna

Mammal activity was moderate, where eleven (11) mammal species were recorded, either through direct observations or evidence of species. No reptile or amphibian species were observed during the survey. However, there is the possibility of some common reptile species being present due to suitable habitat in the area. Certain reptile species are secretive and longer-term surveys are required in order to ensure adequate sampling. Since no natural freshwater resources are present within the project area, limited amphibian species are expected to occur across the area.

Two fauna SCC were recorded, *Hippotragus niger* (Sable Antelope) and *Equus quagga* (Plains Zebra), which is considered to be introduced to the area since portions of the project area is utilised as a game farm. Additionally, the following mammal species that were recorded are listed as protected under Schedule 2 of the North West Biodiversity Management Act No 4 (2016): *Connochaetes taurinus* (Blue Wildebeest), *Damaliscus pygargus phillipsi* (Blesbok), *Equus quagga* (Plains Zebra), *Hippotragus niger* (Sable Antelope), and *Tragelaphus* Oryx (Common Eland). Table 5.2 below indicate fauna species recorded during the field survey.

**Table 5.2:** Threatened mammal species that are expected to occur within the project area

| **Common Name** | **Conservation Status** | | **Likelihood of occurrence** |
|---|---|---|---|
| | **Regional (SANBI, 2016)** | **IUCN (2021)** | |
| **Cheetah** | VU | VU | Low |
| **Cape Clawless Otter** | NT | NT | Low |
| **South Africa Hedgehog** | NT | LC | Moderate |
| **Short-eared Trident Bat** | EN | LC | Low |
| **Makwassie musk shrew** | VU | LC | Low |
| **Swamp Musk Shrew** | NT | LC | Low |
| **Tsessebe** | VU | LC | Low |
| **Bontebok** | VU | VU | Low |
| **Black-footed Cat** | VU | VU | Low |
| **Sable Antelope** | VU | LC | High |
| **Spotted-necked Otter** | VU | NT | Low |
| **Serval** | NT | LC | Moderate |
| **Schreiber's Bent-winged Bat** | Unlisted | VU | Low |
| **White-tailed Rat** | VU | EN | Low |
| **Vlei Rat (Grassland type)** | NT | NT | Low |

| | | | |
|---|---|---|---|
| **Oribi** | EN | LC | Low |
| **Leopard** | VU | VU | Low |
| **Brown Hyaena** | NT | NT | Moderate |
| **Grey Rhebok** | NT | NT | Low |
| **African Striped Weasel** | NT | LC | Low |
| **Mountain Reedbuck** | EN | EN | Low |
| **Blasius's horseshoe bat** | NT | LC | Low |

#### 5.3.1.6 Visual landscape

According to the Visual Impact Assessment (Appendix E3) the proposed Jersey SPP is located approximately 27km northeast from the town of Ventersdorp, 13km north from the N14 National Road and bordering the Klippan gravel road.

The proposed SPP is located in an area with relatively low significance in elevation, meaning that the site is not located on a mountain, at the foot of a mountain or in an area with a significant difference in elevation. The site itself has a difference in elevation of approximately 15 meters. The SPP is located at an above mean sea level (amsl) of approximately 1559m at the highest elevation and at an amsl of 1544m at the lowest elevation. The SPP drains towards the west. The landform and drainage described above is unlikely to limit visibility. Areas within 5km from the proposed development might have a clear view without taking existing screening into account.

The landscape does not have any specific protection or importance and is characterised by mining activities. Figure 5.10 and 5.11 below indicates the Zone of Theoretical Visibility for the PV facility.

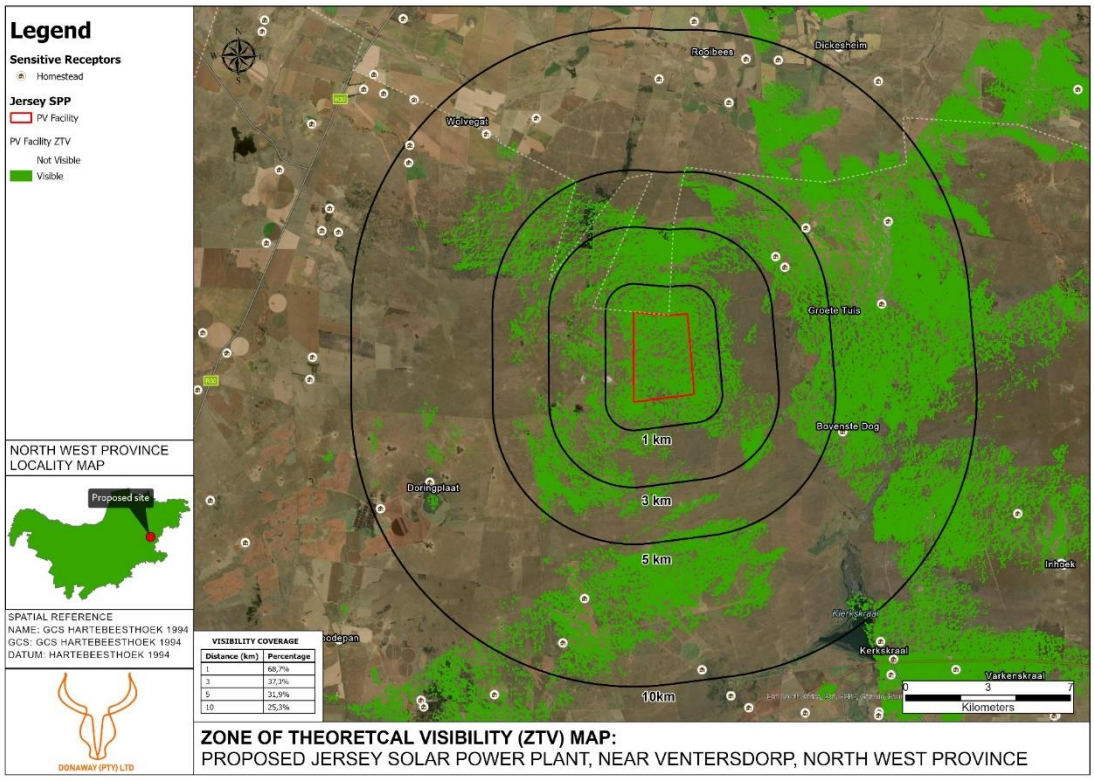


**Figure 5.8:** Zone of Theoretical Visibility (ZTV) for the Jersey Solar Power Plant – Satellite.

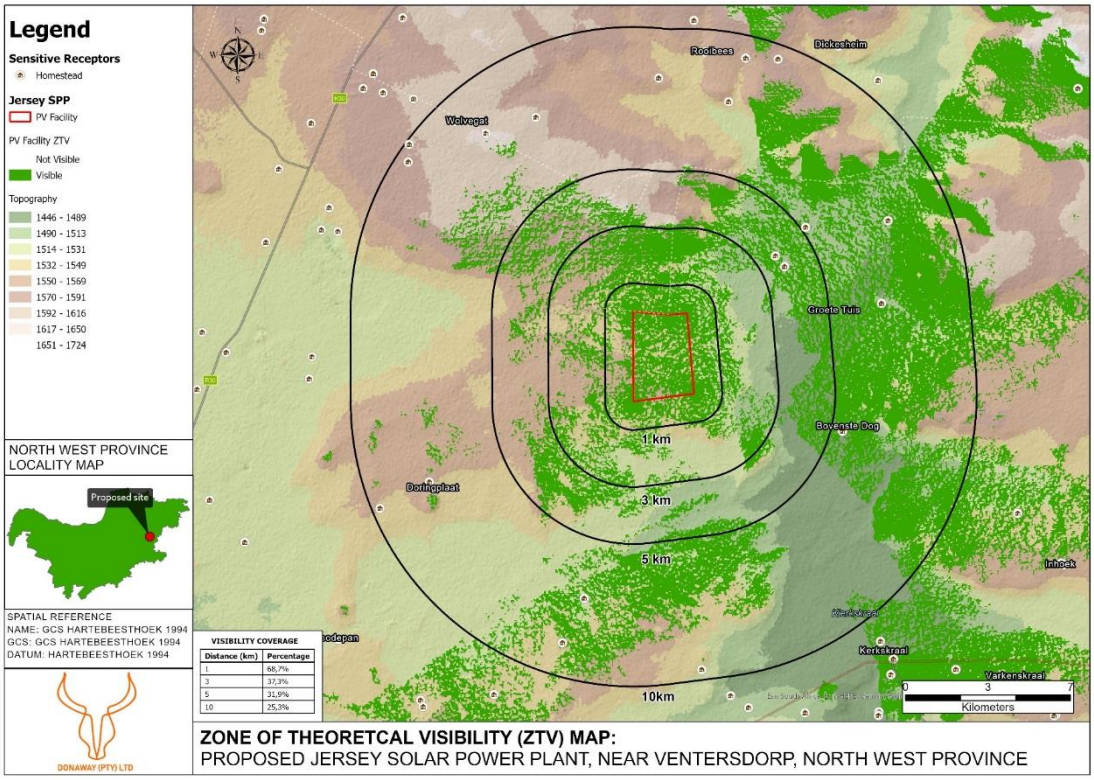


**Figure 5.9:** Zone of Theoretical Visibility (ZTV) for the Jersey Solar Power Plant – Topography.

The ZTV assessment did not consider existing screening such as buildings and vegetation cover but rather the terrain's above mean sea level (AMSL) which indicates line of sight. The main visual receptors in the area are agricultural developments. Receptors that might be the most sensitive to the proposed development are residents living on farms and people travelling on the Klippan gravel road. The proposed SPP development might have a negative low impact after mitigation. The ZTV model also reflects a low theoretical visibility with an average coverage of approximately 36% within the 10km radius. Sensitive visual receptors are very sparsely scattered within the 10km radius, making the site location ideal out of a visual point of view.

#### 5.3.1.7 Traffic consideration

According to the Traffic Impact Study (Appendix E8), access to the Jersey PV SPP is proposed via the existing access road and is via an existing farm access road that intersects with the adjacent unsurfaced roadway D1822 (refer to figure 5.20 for the proposed access and the intersection roads).

Two (2) possible ports of entry have been identified from where the solar panel technology and large electrical components will be transported, namely: Durban (700 km) and Richards Bay (723 km). It is recommended that the Port of Durban is the preferred port of entry as this route is the shorter of the two routes. The regional routes indicated in the analysis would need to be confirmed by freight carriers as suitable for the sensitive normal loads. The final decision on the selected route would be based on a combination of cost, distance and road condition at the time of transport (see Figure 5.16).

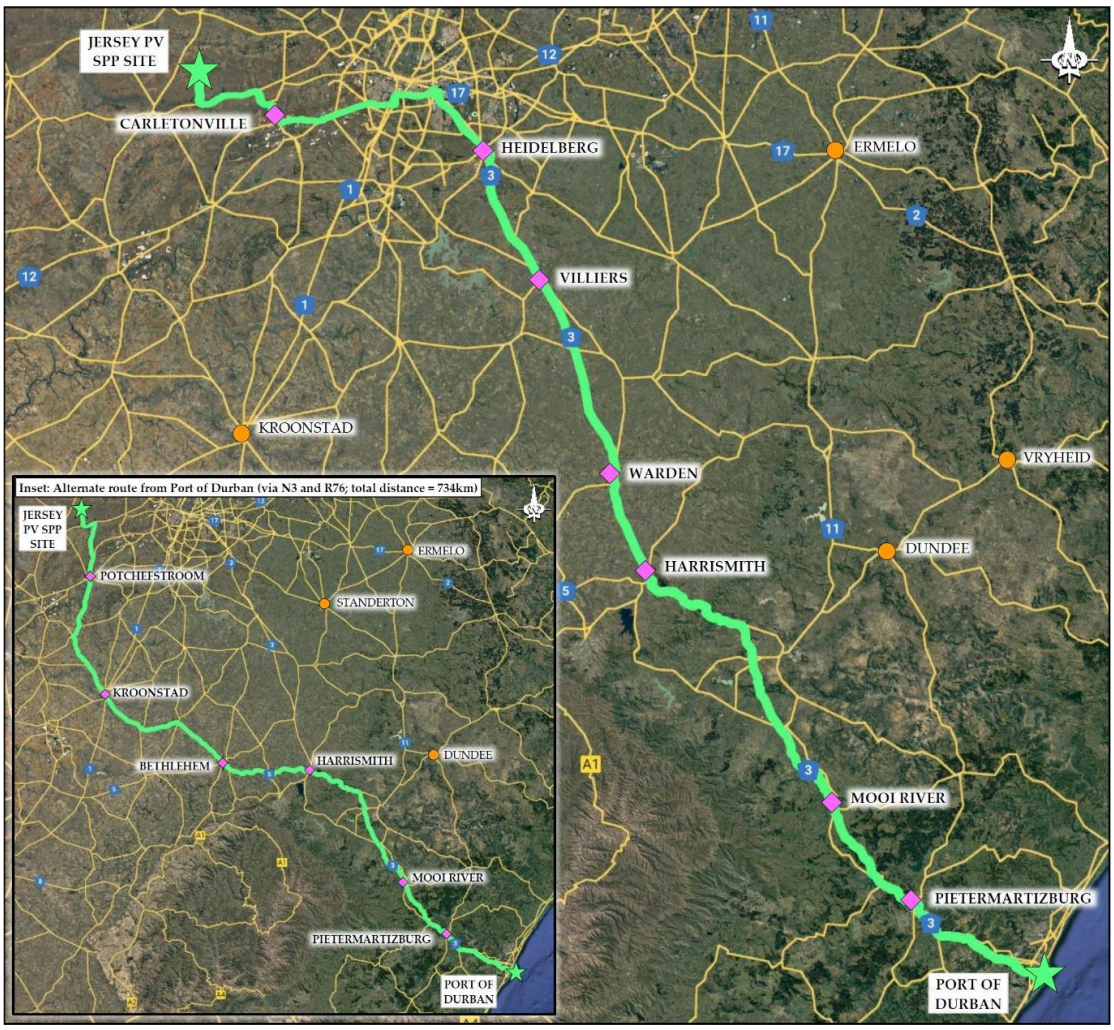


**Figure 5.10:** Shortest haulage route from Port of Durban to Jersey PV SPP (via N3 – total distance = 700 km)

Transformer and substation components are envisaged to form part of the local trips. It is anticipated that these components would be imported and transported from the preferred harbour (Port of Durban is recommended) as abnormal loads. It would then be assembled in Johannesburg and transported to the proposed development site (also as abnormal loads). The distance from Johannesburg to the Jersey PV SPP is approximately 136 km, via the N1.

Cement will be sourced from local manufacturers within the towns of Ventersdorp and Carletonville. All other civil construction materials, needed for concrete and wearing course, will be obtained commercially. Furthermore, it is anticipated that construction personnel and labour would originate from the neighbouring towns such as Ventersdorp and Carletonville (as well as the smaller villages located within a maximum 50 km radius such as Goedgevonden, Ga-Magopa, etc.). These trips are classified as local trips as vehicles will not be travelling over a (comparably) long distance

It is anticipated that some route clearing may be needed with certain portions of the route already cleared for other renewable energy projects. In addition, temporary widening of intersections along the route may also be required in order to simplify the turning movements of the abnormal load vehicles.

### 1.1.1 Description of the socio-economic environment

The socio-economic environment is described with specific reference to social, economic, heritage and cultural aspects.

#### 5.3.1.8 Socio-economic conditions

According to the Social Impact Assessment (Appendix E7) the project is proposed within the North West Province, which covers an area of 104 882km² and has a population of 3 748 436. The mainstay of the economy of North West Province is mining, which generates more than half of the province's gross domestic product and provides jobs for a quarter of its workforce. Mining contributes 23,3% to the North West 's economy and makes up 22,5% of the South African mining industry as a whole).

The project is proposed within the JB Marks Local Municipality (LM) and the Dr Kenneth Kaunda DM. JB Marks LM covers an area of 6 398km² and comprises of two towns: Potchefstroom and Ventersdorp. Gold mining is the dominant economic activity in the district, with Potchefstroom and Ventersdorp being the only exceptions. While Ventersdorp to the north-west of Potchefstroom focuses on agricultural activity, Potchefstroom's economic activity is driven by services and manufacturing. A big role-player in the provision of services in Potchefstroom is the world-class North-West University, which has its main campus in Potchefstroom.

According to the 2016 Community Survey and 2011 Census data, the JB Marks LM, Africans are 90.1% and Coloured 2.7% of the total population. Indian/Asian are 0.3% and whites make out 5.9% of the total population. The gender profile of a population has significance in terms of gender distribution and understanding the gender roles prevalent within the area. The JB Marks LM's female population is 53.2% of the total population of the municipality. The sex ratio for the Dr Kenneth Kaunda DM is almost consistent with that of JB Marks LM, with a female population of 50%. The data from the DM and LM does however not coincide with that of the province since 58,3% of the population are male and 41,7% are female. The national average in 2016 was 50,65% female and 49,35% male. The age structure of a population is important for planning purposes, as it provides insight into what services may be required, and the level to which such services are required. For example, if a population is predominantly over the age of 65 years, then such portion of the population is no longer economically active, and would indicate the need for services such as retirement villages, health care etc. Where most of the population is economically active (between the ages of 15 and 64, the need for business opportunities, suitable employment etc. arises. The JB Marks LM has a youth population (0-14 years) of 28%, working age population (15-64 years) of 67% and an elderly population (65+ years) of 5%.

The dependency ratio of the LM was 49.5 in 2016 implying that for every 100 people within the JB Marks LM, 49,5 of them are considered dependent. This figure is higher than that of the Dr Kenneth Kaunda DM (46,2) and lower than the province (52,9) dependency ratios but is considerably higher than that of the National (34.5) dependency ratio. Of the total number of people in the JB Marks LM, those aged 20 years and older, 7.3% have completed primary school, 28.8% have some secondary education, 30.7% have completed matric and 0.6% have some form of higher education. 4.8% of those aged 20 years and older have no form of schooling. In the JB Marks LM, a total of 11 705 people is employed while 2 273 are discouraged work-seekers. According to Census 2011, 4 321 people are unemployed. The JB Marks LM has a large portion of households live within the poverty level (77.8%) which has an annual income of less than R38 200. Only 1.9% of the households have an annual income of

more than R307 201. In 2011 there were 123 195 households in the JB Marks LM, with an average household size of 3,1 persons per household. The number of households increased by 3 808 to 40 910 households in 2016 as compared to the statistics in 2011. The figure below shows percentage distribution of households by main type of dwelling.

#### 5.3.1.9 Cultural and heritage aspects

According to the Heritage Impact Assessment (Appendix E5) special attention was given to the identification of possible cultural or heritage resources on site.

*Stone Age*

Human occupation of the larger geographical region took place since Early Stone Age (ESA) times. This is evidenced by the scattered stone tools found in a secondary context (open surface material), where they have been exposed in gravel terraces by rivers and streams as well as areas of sheet erosion. Normally this material is viewed to have a low significance and the localities where they are found are referred to as find spots rather than sites.

During the Middle Stone Age (MSA) human population in the region increased dramatically as is evidenced by the large number of finds pots in the larger region. This was the result of people becoming more mobile, occupying areas formerly avoided. According to Thackeray (1992) the MSA is a period that still remains somewhat murky, as much of the MSA lies beyond the limits of conventional radiocarbon dating. However, the concept of the MSA remains useful as a means of identifying a technological stage characterized by flakes and flake-blades with faceted platforms, produced from prepared cores, as distinct from the core tool-based ESA technology.

Open sites were still preferred near watercourses. These people were adept at exploiting the huge herds of animals that passed through the region, on their seasonal migration. As a result, tools belonging to this period also mostly occur in the open or in erosion dongas. Similar to the ESA material, artefacts from these surface collections are viewed not to be in a primary context and have little or no significance.

Late Stone Age (LSA) people had even more advanced technology than the MSA people and therefore succeeded in occupying even more diverse habitats. Also, for the first time we now get evidence of people's activities derived from material other than stone tools. Ostrich eggshell beads, ground bone arrowheads, small, bored stones and wood fragments with incised markings are traditionally linked with the LSA.

LSA people preferred, though not exclusively, to occupy rock shelters and caves and it is this type of sealed context that make it possible for us to learn much more about them than is the case with earlier periods. They have also left us with a rich legacy of rock art, which is an expression of their complex social and spiritual believes.

*Iron Age*

Iron Age people started to settle in southern Africa c. AD 300, with one of the oldest known sites at Broederstroom south of Hartebeespoort Dam dating to AD 470. Having only had cereals (sorghum, millet) that need summer rainfall, Early Iron Age (EIA) people did not move outside this rainfall zone, and neither did they occupy the central interior highveld area.

The occupation of the larger geographical area (including the study area) did not start much before the 1500s. By the 16th century things changed, with the climate becoming warmer and wetter, creating condition that allowed Late Iron Age (LIA) farmers to occupy areas previously unsuitable, for example the central plateau region.

The earliest Iron Age settlers who moved into the North West Province region were Tswana-speakers such as the Tlhaping, Hurutshe, Fokeng, Kgatla and Rolong. In the region of the study area, it was mostly the booRapulana and booRatlou sections of the Rolong (Breutz 1959).

Kaditshwene is a mega sized stone walled Tswana village located in the Marico District of the North-West. This site was occupied from the 18th century onwards by the Bahuruthse Boomokgatlha tribe. The site was visited by the missionary John Cambell in 1815 who left a wealth of historical information about the site.

During the early decades of the 19th century, the Tswana- and Ndebele-speakers were dislodged by the Matabele of Mzilikazi. Internal strife caused Mzilikazi, a general of King Shaka, and his followers to move away from the area between the Thukela and Mfolozi River (KwaZulu-Natal). Eventually, after a sojourn in the Sekhukhuneland area, followed by a short stay in the middle reaches of the Vaal River, they settled north of the Magaliesberg. As a result of this troubled period, Tswana people concentrated into large towns for defensive purposes, e.g. Selonskraal and Shylock, both to the west of Rustenburg. Because of the lack of trees, they built their settlements in stone.

*Historic period*

White settlers moved into the area during the first half of the 19th century. They were largely self-sufficient, basing their survival on cattle/sheep farming and hunting. This remained so up to the present day. The only alternative activity was some sporadic diamond mining that took place in the region. During the Second South African War (1899-1902) some fighting took place in the larger region. Many soldiers that died during these battles were later reburied in a cemetery on the western side of the town of Coligny.

The town of Ventersdorp was founded in 1866 on the farm Roodepoort and proclaimed a town in 1887. It is named after the former owner of the farm, Johannes Venter.

*Site Specific Review:*

From a review of the available old maps and aerial photographs it can be seen that the project area has always been open space, with the main activity being grazing or the making of agricultural fields. No built structures are visible in the project area.

*Palaeontology*

The geology of the proposed Jersey Solar Power Plant is depicted on the 1:250 000 West-Rand 2626 (1986) Geological Map (Council for Geosciences, Pretoria) and is underlain by the Precambrian dolomites and associated marine sedimentary rocks of the Monte Christo and Lyttelton Formations (Malmani Subgroup, Chuniespoort Group, Transvaal Supergroup) Updated geology (mapped by the Council of Geosciences, Pretoria), and indicates that the Malmani Subgroup is represented in the Jersey SPP footprint (refer to figure 5.14).

According to the Palaeontological Impact Assessment (Appendix E6) the Palaeontology Report of the North West Province allocates a High Palaeontological Sensitivity to the Malmani Subgroup. In contrast, the PalaeoMap of the South African Heritage Resources Information

System (SAHRIS) indicates that the Palaeontological Sensitivity of the Malmani Subgroup is Very High (Almond et al, 2013).

The Quaternary superficial deposits are the youngest geological deposits formed during the most recent geological period (approximately 2.6 million years ago to present). Most of the superficial deposits are unconsolidated sediments and consist of clay, gravel, sand, silt, that form relatively thin, discontinuous patches of sediments or larger spreads onshore. These sediments comprise of channel, floodplain and stream deposits, talus gravels and glacial drift sediments.

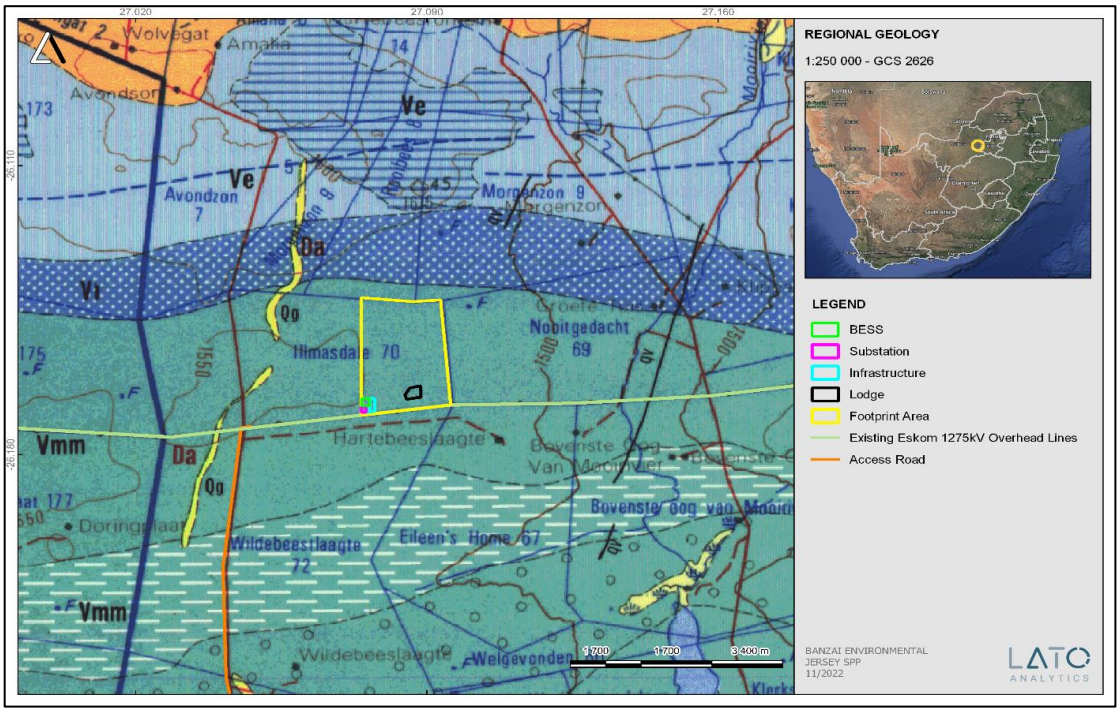


**Figure 5.11:** Extract of the 1:250 000 West-Rand 2626 (1986) Geological Map indicating the geology of the proposed Jersey Solar Power Plant (Council for Geosciences, Pretoria)

The Malmani Subgroup succession is about 2 km-thick and consists of a series of formations of oolitic and stromatolitic carbonates (limestones and dolomites), black carbonaceous shales and minor secondary cherts. The Malmani Dolomites also consist of historic lime mines, and palaeocave fossil deposits. Dolomite (limestone rock) forms in warm, shallow seas from slow gathering remainders of marine microorganisms and fine-grained sediment. Dolomites of the Malmani Subgroup has a higher magnesium content than other limestones. These materials contain high levels of calcium carbonate and are often referred to as carbonates.

## 5.4 SITE SELECTION MATRIX

Due to the nature of the proposed development, the location of the solar power plant is largely dependent on technical and environmental factors such as solar irradiation, climatic conditions, topography of the site, access to the grid and capacity of the grid.

The receptiveness of the site to PV Development includes the presence of optimal conditions for the sitting of a solar energy facility due to high irradiation values and optimum grid connection opportunities (i.e., the grid connection points are located within the affected property which minimizes the length of power line development and consolidates the overall impacts and disturbance of the project within the affected property). Portions 1 and 2 of the

Farm Illmasdale No. 70, where the project is proposed to be located are considered favorable and suitable from a technical perspective due to the following characteristics:

- Climatic conditions: Climatic conditions determine if the project will be viable from an economic perspective as the solar power plant is directly dependent on the annual direct solar irradiation values of a particular area. The North West receives high averages of direct normal and global horizontal irradiation, daily. This is an indication that the regional location of the project includes a low number of rainy days and a high number of daylight hours experienced in the region.

- Topographic conditions: The surface area on which the proposed facility will be located has a favourable level topography, which facilitates work involved with construction and maintenance of the facility and ensures that shadowing on the panels do not occur. The topographic conditions, which are favourable, minimises the significance of the impact that will occur during the clearing and leveling on the site for the construction activities.

- Site availability and access: The land is available for lease by the developer. Reluctant farm owners or farmers over capitalizing hamper efforts to find suitable farms. There is a readily available access which has three connections namely, N14, D1822 and an unnamed gravel road.

- Grid connection: In order for the PV facility to connect to the national grid the facility will have to construct an on-site substation, Eskom switching station and a power line from the project site to connect to the Eskom grid. Available grid connections are becoming scarce and play a huge role when selecting a viable site. A grid connection located within the affected property which presents an opportunity for the consolidation of infrastructure and disturbance within the affected landscape is available.

- Environmental sensitivities: From an environmental perspective the proposed site is considered highly desirable due to less environmental sensitivities in terms of geology, and soils, agricultural potential, vegetation and landscape features, climate, biodiversity and the visual landscape (refer to Section 5.3.1 of this report).

It is evident from the discussion above that Portions 1 and 2 of the farm Illmasdale No. 70, may be considered favourable and suitable in terms of these site characteristics. As mentioned previously, no alternative areas on Portions 1 and 2 of the Farm Illmasdale No. 70. have been considered.

## 5.5 CONCLUDING STATEMENT ON ALTERNATIVES

When considering the information provided by the specialists with regards to the site selection criteria, the site is identified as preferred due to has no sensitive features. Therefore, development of an up to 350 MW Jersey Solar Power Plant on Portions 1 and 2 of the Farm Illmasdale No 70, is the preferred option.

# 6 DESCRIPTION OF THE IMPACTS AND RISKS

This section aims to address the following requirements of the regulations:

**Appendix 3.** (3)(h) An EIR (...) must include-

(h) a full description of the process followed to reach the proposed development footprint, within the approved site, including –

(v) the impacts and risks identified, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;

(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;

(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; and

(viii) the possible mitigation measures that could be applied and level of residual risk

(i) a full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity, including-

(i) a description of all environmental issues and risks that were identified during the EIA process; and

(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.

(j) an assessment of each identified potentially significant impact and risk, including-

(i) cumulative impacts;

(ii) the nature, significance and consequences of the impact and risk;

(iii) the extent and duration of the impact and risk;

(iv) the probability of the impact and risk occurring;

(v) the degree to which the impact and risk can be reversed;

(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and

(vii) the degree to which the impact and risk can be mitigated;

(k) where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;

## 6.1 SCOPING METHODOLOGY

The contents and methodology of the Environmental Impact Report aimed to provide, as far as possible, a user-friendly analysis of information to allow for easy interpretation.

- Checklist (see section 6.1.1): The checklist consists of a list of structured questions related to the environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation and alert against the omission of possible impacts.
- Matrix (see section 6.1.2): The matrix analysis provides a holistic indication of the relationship and interaction between the various activities, development phases and the impact thereof on the environment. The method aims at providing a first order cause and effect relationship between the environment and the proposed activity. The matrix is designed to indicate the relationship between the different stressors and receptors which leads to specific impacts. The matrix also indicates the specialist studies that have been conducted to address the potentially most significant impacts.

### 6.1.1 Checklist analysis

The independent consultant conducted a site visit on 29 September 2022. The site visit was conducted to ensure a proper analysis of the site-specific characteristics of the site. Table 6.1 provides a checklist, which is designed to stimulate thought regarding possible consequences of specific actions and so assist scoping of key issues. It consists of a list of structured questions related to the environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation and alert against the omission of possible impacts. The table highlights certain issues, which are further analysed in matrix format in section 6.2.

**Table 6.1: Environmental checklist**

| QUESTION | YES | NO | Un-sure | Description |
|---|---|---|---|---|
| **1. Are any of the following located on the site earmarked for the development?** | | | | |
| I. A river, stream, dam or wetland | | ✕ | | None. |
| II. A conservation or open space area | | ✕ | | The project area falls within an Ecological Support Area 1. Additionally, the project area is 5 km from the Fred Coetzee Private Nature Reserve, which means the project area is within the 5 km protected area buffer. |
| III. An area that is of cultural importance | | ✕ | | None. |
| IV. Site of geological/palaeontological significance | | ✕ | | None. |
| V. Areas of outstanding natural beauty | | ✕ | | None. |
| VI. Highly productive agricultural land | | ✕ | | None. |

| | | | | |
|---|---|---|---|---|
| VII. Floodplain | | × | | None. |
| VIII. Indigenous Forest | | × | | None. |
| IX. Grass land | × | | | The proposed site is situated within the grassland biome. The project area overlaps with Carletonville Dolomite Grassland vegetation type which is classified as vulnerable. |
| X. Bird nesting sites | | × | | None. |
| XI. Red data species | | × | | None. |
| XII. Tourist resort | × | | | There is a lodge found on Portion 1 of the Farm Illmasdale No. 70. The lodge is owned by the landowner. |
| **2. Will the project potentially result in potential?** | | | | |
| I. Removal of people | | × | | None. |
| II. Visual Impacts | × | | | The VIA (refer to Appendix E3) confirmed that the development of the solar power plant and associated power line will have a visual impact on observers. |
| III. Noise pollution | | × | | Construction activities will result in the generation of noise over a period of months. However, there are mines located directly adjacent to the site. The noise impact is therefore insignificant in comparison to the noise generated by the mine and will only be temporary in nature |
| IV. Construction of an access road | × | | | Access will be obtained from N14 to the south of the site and via another unnamed road to the north of the site. Internal access roads will be constructed for the facility. |
| V. Risk to human or valuable ecosystems due to explosion/fire/ discharge of waste into water or air. | | × | | None. |
| VI. Accumulation of large workforce (>50 manual workers) into the site. | × | | | Approximately 800 employment opportunities will be created during the construction and 15 - 70 employment opportunities during the operation phase of the SPP project. |

| | | | | |
|---|---|---|---|---|
| VII. Utilisation of significant volumes of local raw materials such as water, wood etc. | × | | | The estimated maximum amount of water required during the facility's 20 years of production is approximately 4200m³ per annum. |
| VIII. Job creation | × | | | Approximately 800 employment opportunities will be created during the construction and 15 - 70 employment opportunities during the operational phases for the SPP. |
| IX. Traffic generation | × | | | It is estimated that 42 trips per day will be generated over the 12-18 months construction period for the SPP. |
| X. Soil erosion | × | | | The site will need to be cleared or graded, which may potentially result in a degree of dust being created, increased runoff and potentially soil erosion. The time that these areas are left bare will be limited to the construction phase, since vegetation will be allowed to grow back after construction. No existing areas of erosion was identified. |
| XI. Installation of additional bulk telecommunication, transmission lines or facilities | × | | | There is existing Eskom infrastructure in the area. |
| **3. Is the proposed project located near the following?** | | | | |
| I. A river, stream, dam or wetland | × | | | The Mooi River is located 4 km east of the project area and the closest wetland is 900 m to the west of the site. |
| II. A conservation or open space area | × | | | The project area is 1.5 km from the Fred Coetzee Private Nature Reserve, which means the project area is within the 5 km protected area buffer. |
| III. An area that is of cultural importance | | × | | None. |
| IV. A site of geological/palaeontological resources significance | | × | | None. |
| V. An area of outstanding natural beauty | | × | | None. |
| VI. Highly productive agricultural land | | × | | None. |
| VII. A tourist resort | | × | | None. |

| | | | | |
|---|---|---|---|---|
| VIII. A formal or informal settlement | | ✕ | | None. |

### 6.1.2 Matrix analysis

The matrix describes the relevant listed activities, the aspects of the development that will apply to the specific listed activity, a description of the environmental issues and potential impacts, the significance and magnitude of the potential impacts and possible mitigation measures. The matrix also highlights areas of particular concern (see Table 6.2) for more in-depth assessment during the EIA process. An indication is provided of the specialist studies conducted and which informed the initial assessment. Each cell is evaluated individually in terms of the nature of the impact, duration and its significance – should no mitigation measures be applied. This is important since many impacts would not be considered insignificant if proper mitigation measures were implemented.

In order to conceptualise the different impacts, the matrix specify the following:

- **Stressor**: Indicates the aspect of the proposed activity, which initiates and cause impacts on elements of the environment.
- **Receptor**: Highlights the recipient and most important components of the environment affected by the stressor.
- **Impacts**: Indicates the net result of the cause-effect between the stressor and receptor.
- **Mitigation**: Impacts need to be mitigated to minimise the effect on the environment.

Detailed impact assessments have been undertaken by each of the respective specialists which has informed the matrix analysis as included in Table 6.2 below, as well as the key issues identified as included in sections 6.2.1-6.2.3. The table included on the overleaf includes reference to the sections in the respective specialist studies where the details of the in-depth assessment of potential environmental impacts can be obtained.

Table 6.2: Matrix analysis

For ease of reference the significance of the impacts is colour-coded as follow:

| Low significance | Medium significance | High significance | Positive impact |
|---|---|---|---|

| LISTED ACTIVITY (The Stressor) | ASPECTS OF THE DEVELOPMENT /ACTIVITY | | POTENTIAL IMPACTS | | SIGNIFICANCE AND MAGNITUDE OF POTENTIAL IMPACTS | | | | | | | MITIGATION OF POTENTIAL IMPACTS | | | SPECIALIST STUDIES / INFORMATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Receptors | ImpactFF description / consequence | Minor | Major | Extent | Duration | Probability | Reversibility | Irreplaceable loss of resources | Possible Mitigation | Possible mitigation measures | Level of residual risk | |
| **CONSTRUCTION PHASE** | | | | | | | | | | | | | | | |
| Activity 11(i) (GNR 327): "The development of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts."<br><br>Activity 24 (ii) (GN.R 327): *"The development of a road (ii) with reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 meters"*<br><br>Activity 28 (ii) (GN.R 327): *"Residential,* | Site clearing and preparation<br><br>Certain areas of the site will need to be cleared of vegetation and some areas may need to be levelled.<br><br>Civil works<br><br>The main civil works are:<br>• Terrain levelling if necessary– Levelling will be minimal as the potential site chosen is relatively flat.<br>• Laying foundation- The structures will be connected to the ground through cement | BIOPHYSICAL ENVIRONMENT | Fauna & Flora | • Loss and fragmentation of vegetation communities.<br>• Disturbance of floral and faunal species and their habitats.<br>• Loss of Irreplaceable Resources (Ecological Support Area and indigenous vegetation) | | - | S | L | D | PR | ML | Yes | • See Table 6.4 | M | Terrestrial Biodiversity Compliance Statement (Appendix E1) |
| | | | Wetlands/ Watercourse | • During the site assessment, no wetlands were found within the project area of influence. The project area was characterised by Vaalbos and Hutton soil form which are dry soil forms not found within wetland areas. | | - | - | - | - | - | - | - | - - | - | Wetland Assessment (Appendix E1) |
| | | | Avifauna | • Destruction, fragmentation and degradation of habitats and ecosystems.<br>• Direct mortality of avifauna.<br>• Reduced migration of avifauna. | | - | S | M | Pr | PR | ML | Yes | • Limit construction footprint and retain indigenous vegetation wherever possible. | L | Avifauna Scoping Assessment |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 1998 and where such development (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare."*<br><br>Activity 56 (ii) (GN.R 327): "The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre (ii) where no reserve exists, where the existing road is wider than 8 metres…"<br><br>Activity 1 (GN.R 325): *"The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more."*<br><br>Activity 15 (GN.R 325): *"The clearance of an area of 20 hectares or more of indigenous vegetation."* | pillars, cement slabs or metal screws. The exact method will depend on the detailed geotechnical analysis.<br>• Construction of access and inside roads/paths – existing paths will be used were reasonably possible. Additionally, the turning circle for trucks will also be taken into consideration.<br><br>Transportation and installation of PV panels into an Array<br><br>The panels are assembled at the supplier's premises and will be transported from the factory to the site on trucks. The panels will be mounted on metal structures which are fixed into the ground either through a concrete foundation or a deep-seated screw.<br><br>Wiring to the Central Inverters<br><br>Sections of the PV array would be wired to central inverters which have a maximum rated power of 2000kW each. The inverter is a pulse width mode inverter that converts DC electricity to alternating | | | • Avifaunal mortality due to light pollution (nocturnal species becoming more visible to predators) | | | | | | | | | • Limit access to remainder of area, avoid breeding season (summer).<br>• Lay-down areas must only be located on disturbed zones.<br>• Construct in shortest timeframe.<br>• Control noise to minimum. | | (Appendix E2) |
| | | | Air | • Air pollution due to the increase of traffic of construction vehicles and the undertaking of construction activities. | - | | S | S | D | CR | NL | Yes | • See Table 6.4 | L | Terrestrial Biodiversity Compliance Statement (Appendix E1) |
| | | | Groundwater | • Pollution due to construction vehicles and the storage and handling of dangerous goods. | - | | S | S | Pr | CR | ML | Yes | • A groundwater monitoring programme (quality and groundwater levels) should be designed and installed for the site. Monitoring boreholes should be securely capped (where used), and must be fitted with a suitable sanitary seal to prevent surface water flowing down the outside of the casing. Full construction details of monitoring boreholes must be recorded when they are drilled (e.g. screen and casing lengths, diameters, total depth, etc).<br>• Sampling of monitoring boreholes should be done according to recognised standards. | L | - |
| | | | General Environment<br><br>(risks associated with BESS) | • Mechanical breakdown / Exposure to high temperatures<br>• Fires, electrocutions and spillage of toxic substances into the surrounding environment. | | - | S | M | Pr | PR | ML | Yes | • Refer to Table 6.6 | L | - |

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| *Add listing notice 3 activities.*<br><br>Activity 4 (h)(iv) (GN.R 324): *"The development of a road wider than 4 metres with a reserve less than 13,5 metres within (h) the North West, (iv) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority".*<br><br>Activity 12 (h)(iv) GN.R 324): *"The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation in (h) North West (iv) within Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority".*<br><br>Activity 18 (h)(v) (GN.R 324): *"The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre in (h) North within (v) Critical biodiversity areas as identified in systematic biodiversity* | electricity (AC) at grid frequency. | | | • Spillage of hazardous substances into the surrounding environment.<br>• Soil contamination – leachate from spillages which could lead to an impact of the productivity of soil forms in affected areas.<br>• Water Pollution – spillages into surrounding watercourses as well as groundwater.<br>• Health impacts – on the surrounding communities, particularly those relying on watercourses (i.e. rivers, streams, etc) as a primary source of water.<br>• Generation of hazardous waste. | | | | | | | | | | |
| | | SOCIAL/ECONOMIC ENVIRONMENT | Local unemployment rate | • Creation of direct and indirect employment and skills development opportunities.<br>• Improvements to shared infrastructure.<br>• Economic multiplier effects | | + | P | S | D | I | N/A | Yes | • Where reasonable and practical, the SPP service providers should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories | L | Social Impact Assessment<br><br>(Appendix E7) |
| | | | Visual landscape | • Potential visual impact on residents of farmsteads and motorists in close proximity to proposed facility.<br>• Visual and sense of place impacts.<br>• Potential visual impact on residents of farmsteads and motorists in close proximity to proposed facility.<br>• Visual and sense of place impacts.<br>• Visual impacts of solar glint and glare as a visual distraction and possible air travel hazard.<br>• Visual impact on sensitive visual receptors in close proximity to the 132kV overhead power line | - | | L | S | D | CR | NL | Yes | • Ensure that vegetation is not unnecessarily removed during the construction phase.<br>• Plan the placement of laydown areas and temporary construction. | L | Visual Impact Assessment<br><br>(Appendix E3) |
| | | | Traffic volumes | • Traffic Congestion and the associated dust and noise pollution. | - | | L | S | D | CR | NL | Yes | • See Table 6.4 | L | Traffic Impact Assessment |

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| *plans adopted by the competent authority".* | | | | • Transport of equipment, material and staff to site will lead to congestion. | | | | | | | | | | (Appendix E8) |
| | | | Health & Safety | • Increased risk of veld fires.<br>• In-migration of people (non-local workforce and jobseekers)<br>• Safety and security impacts | | - | L | L | Pr | PR | ML | Yes | • See Table 6.4 | L | Social Impact Assessment<br>(Appendix E7) |
| | | | Noise levels | • The generation of noise as a result of construction vehicles, the use of machinery such as drills and people working on the site. | - | | L | S | D | CR | NL | Yes | • During construction care should be taken to ensure that noise from construction vehicles and plant equipment does not intrude on the surrounding residential areas. Plant equipment such as generators, compressors, concrete mixers as well as vehicles should be kept in good operating order and where appropriate have effective exhaust mufflers. | L | Social Impact Assessment<br>(Appendix E7) |
| | | | Tourism industry | • Since there are no tourism facilities in close proximity to the site, the proposed activities will not have an impact on tourism in the area. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | • N/A | N/A | N/A |
| | | | Heritage resources | - Direct or physical impacts, implying alteration or destruction of heritage features within the project boundaries | - | | S | S | U | PR | NL | Yes | • Known sites should be clearly marked, so that they can be avoided during construction activities.<br>• The contractors and workers should be notified that archaeological sites might be exposed during the construction activities.<br>• Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer (ECO) shall be notified as soon as possible. | L | Phase 1 Cultural Heritage Assessment (Appendix E5) |

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| | | | | | | | | | | | | | • All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the ECO will advise the necessary actions to be taken.<br>• Any discovered artifacts shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits shall be obtained from the SAHRA should the proposed site affect any world heritage sites or if any heritage sites are to be destroyed or altered.<br>• Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site. | | |
| | | | Paleontological Heritage | • Disturbance, damage or destruction of legally protected fossil heritage within the development footprint during the construction phase.<br>• Disturbance of fossils (stromatolites) of the Malmani (Chuniespoort Group, Transvaal Supergroup) | - | | S | P | U | BR | CL | Yes | • Outcrops of weathered to fairly well-preserved stromatolites were discovered on the development. Mitigation of a sample of well-preserved stromatolites is thus recommended. | L | Paleontological Impact Assessment (Appendix E6) |
| **OPERATIONAL PHASE** | | | | | | | | | | | | | | | |
| Activity 11(i) (GN.R. 327): | The key components of the proposed project are described below: | BIOPHYSICAL | Fauna and Flora | • Habitat destruction / fragmentation of fauna habitats<br>• Soil erosion and sedimentation | | - | S | M | Po | PR | ML | Yes | • See Table 6.5 | L | Terrestrial Biodiversity Compliance Statement |

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| "The development of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts."<br><br>Activity 1 (GN.R 325): *"The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more."* | • PV Panel Array - To produce 350 MW, the proposed facility will require numerous linked cells placed behind a protective glass sheet to form a panel. Multiple panels will be required to form the solar PV arrays which will comprise the PV facility. The PV panels will be tilted at a northern angle in order to capture the most sun.<br>• Wiring to Central Inverters - Sections of the PV array will be wired to central inverters. The inverter is a pulse width mode inverter that converts direct current (DC) electricity to alternating current (AC) electricity at grid frequency.<br>• Connection to the grid Connecting the array to the electrical grid requires transformation of the voltage from 480V to 33kV to 132kV. The normal components and dimensions of a distribution rated | | | • Spread and establishment of alien invasive plant species<br>• Habitat degradation due to dust<br>• Spillages of harmful substances<br>• Road mortalities of fauna / impact of human activities on site | | | | | | | | | | (Appendix E1) |
| | | | Avifauna | • Electrocution when perched on power line infrastructure Destruction, fragmentation and degradation of habitats and ecosystems.<br>• Direct mortality of avifauna.<br>• Reduced migration of avifauna. | | - | S | L | Pr | PR | ML | Yes | • See Table 6.5 | M | Avifauna Scoping Assessment (Appendix E2) |
| | | | Air quality | • The proposed development will not result in any air pollution during the operational phase. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | • N/A | N/A | N/A |
| | | | Groundwater | • Leakage of hazardous materials. The development will comprise of a distribution substation and switching station and will include transformer bays which will contain transformer oils. Leakage of these oils can contaminate water supplies. | - | | L | L | Po | PR | ML | Yes | • All areas in which substances potentially hazardous to groundwater are stored, loaded, worked with or disposed of should be securely bunded (impermeable floor and sides) to prevent accidental discharge to groundwater. | L | - |
| | | | Wetland / Watercourse | • During the site assessment, no wetlands were found within the project area of influence. The project area was characterised by Vaalbos and Hutton soil form which are dry soil forms not found within wetland areas. | | - | - | - | - | - | - | - | ○ - | - | Wetland Assessment (Appendix E1) |
| | | SOCIAL/ECONOMIC | Visual landscape | • Potential visual impact on residents of farmsteads and motorists in close proximity to proposed facility.<br>• Visual and sense of place impacts. | | - | L | L | D | PR | ML | Yes | • Ensure that vegetation is not unnecessarily removed during the construction phase. | L | Visual Impact Assessment (Appendix E3) |

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| | electrical substation will be required. Output voltage from the inverter is 480V and this is fed into step up transformers to 132kV. An onsite substation and switching station will be required on the site to step the voltage up to 132kV, after which the power will be evacuated into the national grid.<br>• <u>Supporting Infrastructure</u> – Auxiliary buildings with basic services such as water and electricity will be constructed on the site and will have an approximate footprint 820m². Other supporting infrastructure includes voltage and current regulators, protection circuitry and Battery Energy Storage Systems (BESS).<br>• <u>Roads</u> – Access will be obtained via the N14 South to the site. An internal site road network will also be required to provide access to the solar field and associated | | | | | | | | | | | | • Plan the placement of laydown areas and temporary construction. | | |
| | | | Traffic volumes | • The proposed development will not result in any traffic impacts during the operational phase. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | • The traffic generated during this phase will be negligible and will not have any impact on the surrounding road network. | N/A | Traffic Impact Assessment (Appendix E8) |
| | | | Health & Safety | • The proposed development will not result in any health and safety impacts during the operational phase. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | • - | N/A | N/A |
| | | | Noise levels | • The proposed development will not result in any noise pollution during the operational phase. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | • N/A | N/A | N/A |
| | | | Heritage resources | • Direct or physical impacts, implying alteration or destruction of heritage features within the project boundaries. | - | | S | S | U | PR | NL | Yes | • No sites or features of cultural and heritage significance were present on site.<br>• Known sites should be clearly marked, so that they can be avoided during construction activities.<br>• The contractors and workers should be notified that archaeological sites might be exposed during the construction activities.<br>• Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer (ECO) shall be notified as soon as possible.<br>• All discoveries shall be reported immediately to a heritage practitioner so that an | L | Heritage Impact Assessment (Appendix E5) |

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| | infrastructure. All site roads will require a width of approximately 6 m – 12 m.<br>• Fencing - For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farm. | | | | | | | | | | | | investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the ECO will advise the necessary actions to be taken.<br>• Any discovered artifacts shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits shall be obtained from the SAHRA should the proposed site affect any world heritage sites or if any heritage sites are to be destroyed or altered.<br>• Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site | | |
| | | | Electricity supply | • Generation of additional electricity.<br>• The power line will transport generated electricity into the grid. | + | | I | L | D | I | N/A | Yes | • - | N/A | - |
| | | | Electrical infrastructure | • Additional electrical infrastructure. The proposed solar facility will add to the existing electrical infrastructure and aid to lessen the reliance of electricity generation from coal-fired power stations. | + | | I | L | D | I | N/A | Yes | • - | N/A | - |
| **DECOMMISSIONING PHASE** | | | | | | | | | | | | | | | |
| - | Dismantlement of infrastructure<br>During the decommissioning phase the Solar PV Energy facility and its associated infrastructure will be dismantled. | BIOPHYSICAL ENVIRONMENT | Fauna and Flora | - Improvement of habitat through revegetation / succession over time<br>- Soil erosion and sedimentation<br>- Spread and establishment of alien invasive species.<br>- Habitat degradation due to dust.<br>- Spillages of harmful substances. | | - | S | L | Po | PR | ML | Yes | • All temporary stockpile areas, litter and dumped material and rubble must be removed and discarded with in an environmentally friendly way.<br>• Undeveloped areas that were degraded due to human activities must be rehabilitated. | L | Terrestrial Biodiversity Compliance Statement (Appendix E1) (Appendix E1) |

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| | Rehabilitation of biophysical environment<br><br>The biophysical environment will be rehabilitated. | | | - Road mortalities of fauna / impact of human activities on site. | | | | | | | | | • Hazardous chemicals must be stored on an impervious surface and protected from the elements. These chemicals must be strictly controlled, and records kept of when it was used and by whom.<br>• Any alien plants observed must be reported to the environmental manager and must be removed as soon as possible.<br>• All vehicles should be inspected for oil and fuel leaks on a regular basis.<br>• Drainage must be controlled to ensure that runoff from the site will not culminate in off-site pollution or result in rill and gully erosion. | | |
| | | | Air quality | • Air pollution due to the increase of traffic of construction vehicles. | - | | S | S | D | CR | NL | Yes | • Regular maintenance of equipment to ensure reduced exhaust emissions. | L | - |
| | | | Soil | • Soil degradation, including erosion.<br>• Disturbance of soils and existing land use (soil compaction).<br>• Physical and chemical degradation of the soils by construction vehicles (hydrocarbon spills). | | - | S | S | Pr | PR | M | Yes | • Implement an effective system of stormwater run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion.<br>• Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion. | L | - |

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| | | | | | | | | | | | | | | • If an activity will mechanically disturb the soil below surface in any way, then any available topsoil should first be stripped from the entire surface to be disturbed and stockpiled for re-spreading during rehabilitation.<br>• During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface. | | |
| | | | Groundwater | • Pollution due to construction vehicles | - | | S | S | Pr | CR | ML | Yes | • All vehicles should be inspected for oil and fuel leaks on a regular basis.<br>• Vehicle maintenance yards on site should make provision for drip trays that will be used to capture any spills. Drip trays should be emptied into a holding tank and returned to the supplier. | L | - |
| | | | Visual landscape | • Potential visual impact on visual receptors in close proximity to proposed facility.<br>• The decommissioning phase of the project will result in the same visual impacts experienced during the construction phase of the project. However, in the case of Jersey SPP it is anticipated that the proposed facility will be refurbished and upgraded to prolong its life. | - | | L | S | D | CR | NL | Yes | • Locate laydown and storage areas in zones of low visibility i.e. behind tall trees or in lower lying areas. | L | Visual Impact Assessment (Appendix E3) |
| | | | Traffic volumes | - Traffic Congestion and the associated dust and noise pollution.<br>• Transport of equipment, material and staff to site will lead to congestion. | - | | L | S | D | CR | NL | Yes | • Stagger component delivery to site.<br>• Reduce the construction period. | L | Traffic Impact Assessment (Appendix E8) |

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| | | | | | | | | | | | | | • Make use of mobile batch plants and quarries in close proximity to the site<br>• Staff and general trips should occur outside of peak traffic periods.<br>• Regular maintenance of gravel roads by the Contractor must be undertaken. | | |
| | | | Health & Safety | • Air/dust pollution.<br>• Road safety.<br>• Increased crime levels. The presence of construction workers on the site may increase security risks associated with an increase in crime levels as a result of influx of people in the rural area. | - | | L | S | Pr | PR | ML | Yes | • Demarcated routes to be established for construction vehicles to ensure the safety of communities, especially in terms of road safety and communities to be informed of these demarcated routes.<br>• Where dust is generated by trucks passing on gravel roads, dust mitigation must be enforced.<br>• Any infrastructure that would not be decommissioned must be appropriately locked and/or fenced off to ensure that it does not pose any danger to the community.<br>• Components that are dismantled must be recycled / reduced as far as possible. | L | Social Impact Assessment<br>(Appendix E7) |
| | | | Noise levels | • The generation of noise as a result of construction vehicles, the use of machinery and people working on the site | - | | L | S | D | CR | NL | Yes | • The decommissioning phase must aim to adhere to the relevant noise regulations and limit noise within standard working hours in order to reduce disturbance of dwellings in close proximity to the development. | L | Social Impact Assessment<br>(Appendix E7) |
| | | | Tourism industry | • Since there are no tourism facilities in close proximity to the site, the decommissioning activities will not | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | • N/A | N/A | N/A |

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| | | | | have an impact on tourism in the area. | | | | | | | | | | | |
| | | | Heritage resources | • It is not foreseen that the decommissioning phase will impact on any heritage resources. | - | | S | S | U | PR | ML | Yes | • Any discovered artifacts shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits shall be obtained from the SAHRA should the proposed site affect any world heritage sites or if any heritage sites are to be destroyed or altered. | L | Heritage Impact Assessment (Appendix E5) |

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| Nature of the impact: | (N/A) No impact | (+) Positive Impact (-) | Negative Impact | |
| Geographical extent: | (S) Site; | (L) Local/District; | (P) Province/Region; | (I) International and National |
| Probability: | (U) Unlikely; | (Po) Possible; | (Pr) Probable; | (D) Definite |
| Duration: | (S) Short Term; | (M) Medium Term; | (L) Long Term; | (P) Permanent |
| Intensity / Magnitude: | (L) Low; | (M) Medium; | (H) High; | (VH) Very High |
| Reversibility: | (CR) Completely Reversible; | (PR) Partly Reversible; | (BR) Barely Reversible; | - |
| Irreplaceable loss of resources: | (IR) Irreversible | (NL) No Loss; | (ML) Marginal Loss; | (SL) Significant Loss; | (CL) Complete Loss |
| Level of residual risk: | (L) Low; | (M) Medium; | (H) High; | (VH) Very High | - |

## 6.2 KEY ISSUES IDENTIFIED

From the above it is evident that mitigation measures should be available for potential impacts associated with the proposed activity and development phases. The scoping methodology identified the following key issues which are addressed in more detail in this draft EIR.

### 6.2.1 Impacts during the construction phase

During the construction phase the following activities will have various potential impacts on the biophysical and socio-economic environment:

- Activity 11(i) (GNR 327): *"The development of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts."*
- Activity 24(ii) (GN.R 327): *"The development of a road (ii) with reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 meters"*
- Activity 28(ii) (GN.R 327): *"Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 1998 and where such development (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare."*
- Activity 56(ii) (GN.R 327): *"The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre (ii) where no reserve exists, where the existing road is wider than 8 metres…"*
- Activity 1(GN.R 325): *"The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more."*
- Activity 15(GN.R 325): *"The clearance of an area of 20 hectares or more of indigenous vegetation."*
- Activity 4 (h)(iv) (GN.R 324): *"The development of a road wider than 4 metres with a reserve less than 13,5 metres within (h) the North West, (iv) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority".*
- Activity 12 (h)(iv) GN.R 324): *"The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation in (h) North West (iv) within Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority".*
- Activity 18 (h)(v) (GN.R 324): *"The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre in (h) North within (v) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority".*

During the construction phase minor negative impacts are foreseen over the short term. The latter refers to a period of months. Table 6.3 summarises the potentially most significant impacts and the mitigation measures that are proposed during the construction phase.

**Table 6.3:** Impacts and the mitigation measures during the construction phase

| SPECIALIST STUDY | IMPACT | PRE-MITIGATION RATING | POST MITIGATION RATING | SUMMARY OF MITIGATION MEASURES |
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| Terrestrial Biodiversity Compliance Statement (Appendix E1) | Loss and fragmentation of vegetation communities.<br><br>Disturbance of floral and faunal species and their habitats.<br><br>Loss of Irreplaceable Resources (Ecological Support Area and indigenous vegetation) | Negative Very High | Negative Medium | • Bruch cutting should be implemented beneath the panels, no vegetation clearing should be permitted.<br><br>• Areas to be developed/disturbed must be specifically demarcated so that during the construction/activity phase, only the demarcated areas to be impacted upon.<br><br>• Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should not be fragmented or disturbed further.<br><br>• All vehicles and personnel must make use of existing roads and walking paths, especially construction/operational vehicles.<br><br>• All laydown, chemical toilets etc. should be restricted to 'Very Low' sensitivity areas as far as possible. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction/closure phase has been concluded.<br><br>• Areas that are denuded during construction that are not within the proposed footprint area need to be re-vegetated with indigenous vegetation to prevent erosion during flood events and strong winds and to support the adjacent habitat. |

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| | | | | • No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants.<br>• Any holes/deep excavations must be dug in a progressive manner in order to allow burrowing animals time to move off and to prevent trapping. Should the holes remain open overnight they must be covered temporarily to ensure no fauna species fall in.<br>• The proposed area to be developed must be disturbed by walking the area, prior to clearing of the area. This will allow fauna to move off from the area.<br>• Clearing and/or disturbance activities must be conducted in a progressive linear manner, from the north to the south of the project area and over several days, so as to provide an easy escape route for all small mammals and herpetofauna. |
| | Waste Management | Negative Medium | Negative Low | • Waste management must be a priority and all waste must be collected and stored effectively and responsibly according to a site-specific waste management plan. Dangerous waste such as metal wires and glass must only be stored in fully sealed and secure containers, before being moved off site as soon as possible.<br>• Any litter, spills, fuels, chemical and human waste in and around the project area must be removed and disposed of timeously and responsibly.<br>• It must be made an offence to litter or dump any material outside of specially demarcated and managed zones. Signs and protocols must be established to explain and enforce this. |

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| | | | | • Portable toilets must be provided in the ratio provided in the Health and Safety Act. Portable toilets must be regularly pumped dry to ensure that the system does not degrade over time and spill into the surrounding area.<br>• The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility.<br>• Where a registered disposal facility is not available close to the project area, the Contractor/property owner shall provide a method statement with regards to waste management. Under no circumstances may domestic waste be burned on site. Waste may never be stored in an open pit where it is susceptible to the elements such as wind and rain. |
| | Pollution due to construction vehicles and the storage and handling of dangerous goods. | Negative Medium | Negative Low | • The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site.<br>• Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use.<br>• No servicing of equipment is to take place on site unless necessary.<br>• All contaminated soil shall be treated in situ or removed and be placed in containers.<br>• Appropriately contain any diesel storage tanks and/or machinery spills (e.g., accidental spills of hydrocarbons, oils, diesel etc.) in such a way as to prevent them leaking and entering the environment. |

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| | Spreading of alien invasive species | Negative Medium | Negative Low | • The implementation of an Alien Invasive Plant management plan is important, especially because of the invasive species identified on site which, if left unchecked, will continue to grow and spread prolifically leading to further and more significant deterioration to the health of the natural environment within the project area.<br>• The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas.<br>• Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site. A location specific waste management plan must be put in place to limit the presence of rodents and pests and waste must not be allowed to enter surrounding areas.<br>• A pest control plan must be put in place and implemented; it is imperative that poisons not be used to control pests. |
| | Negative effect of human activities on fauna and flora and road mortalities on fauna | Negative Medium | Negative Low | • No trapping, killing, or poisoning of any wildlife is to be allowed. Signs must be put up to enforce this. These actions are illegal in terms of provincial environmental legislation.<br>• A qualified environmental control officer must be on site when clearing begins. The area must be walked though by a qualified ecologist prior to construction to ensure that no faunal species remain in the habitat and get killed. Should animals not move out |

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| | | | | of the area on their own relevant specialists must be contacted to advise on how the species can be relocated.<br>• Any holes/deep excavations must be dug in a progressive manner in order to allow burrowing animals time to move off and to prevent trapping. Should the holes remain open overnight they must be covered temporarily to ensure no fauna species fall in.<br>• The proposed area to be developed must be disturbed by walking the area, prior to clearing of the area. This will allow fauna to move off from the area.<br>• Clearing and/or disturbance activities must be conducted in a progressive linear manner, from the north to the south of the project area and over several days, so as to provide an easy escape route for all small mammals and herpetofauna.<br>• The duration of the construction should be minimized to as short a term as possible, to reduce the period of disturbance on fauna.<br>• Outside lighting should be designed and limited to minimize impacts on fauna. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (yellow) lights should be used wherever possible. |
| Wetland Baseline & Risk Assessment (Appendix E1) | Impact on the characteristics of the watercourse | - | - | • During the site assessment, no wetlands were found within the project area of influence. The project area was characterised by Vaalbos and Hutton soil form which are dry soil forms not found within wetland areas. be adapted to fit natural patterns rather than imposing rigid geometries. |

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| Avifaunal Assessment<br>(Appendix D2) | Habitat destruction within the project footprint | Negative High | Negative Medium | • Solar panels must be mounted on pile driven or screw foundations, such as post support spikes, rather than heavy foundations, such as trench-fill or mass concrete foundations, to reduce the negative effects on natural soil functioning, such as its filtering and buffering characteristics, while maintaining habitats for both fossorial and epigeic biodiversity (Bennun et al, 2021). If concrete foundations are used that would increase the impact of the project as there would be direct impacts to soil permeability and characteristics, thereby influencing inhabitant fauna. In addition, stormwater runoff and runoff from cleaning the panels would be increased, increasing erosion in the surrounding areas;<br>• Indigenous vegetation to be maintained under the solar panels to ensure biodiversity is maintained and to prevent soil erosion (Beatty et al, 2017; Sinha et al, 2018). The photographs below are sourced from these documents;<br>• Vegetation clearing to commence only after the necessary permits have been obtained; and<br>• Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities. |
| | Destruction, degradation and fragmentation of surrounding habitats | Negative High | Negative Low | • Pre-construction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes awareness of no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, remaining within demarcated construction areas etc.<br>• All solid waste must be managed in accordance with the Solid Waste Management Plan. Recycling is encouraged;<br>• All construction activity and roads to be within the clearly defined and demarcated areas; |

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| | | | | • Temporary laydown areas should be clearly demarcated and rehabilitated with indigenous vegetation subsequent to end of use;<br>• Appropriate dust control measures to be implemented;<br>• Suitable sanitary facilities to be provided for construction staff as per the guidelines in Health and Safety Act;<br>• No cement/concrete may be mixed on site where feasible and must be brought in off site to ensure the water sources does not get polluted and that successful rehabilitation of the construction areas can take place; and<br>• All hazardous materials, if any, should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner. |
| | Displacement/emigration of avifauna community (including SCC) due to noise pollution | Negative Medium | Negative Low | • Noise pollution is difficult to mitigate against.<br>• No construction activity is to occur at night, as nocturnal species are highly dependent on sound and/or vocalisations for behavioural processes;<br>• All vehicles speed must be restricted to 20 km/h, to reduce the noise emitted by them; and<br>• If generators are to be used these must be soundproofed. |
| | Direct mortality from persecution or poaching of avifauna species and collection of eggs | Negative Medium | Negative Low | • All personnel should undergo environmental awareness training that includes educating on not poaching/persecuting species and collecting eggs;<br>• Prior to commencing work each day, two individuals should traverse the working area in order to disturb any avifauna and so they have a chance to vacate the area; and |

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| | | | | • Any avifauna threatened by the construction activities that does not vacate the area should be removed safely by an appropriately qualified environmental officer or removal specialist. |
| | Direct mortality from increased vehicle and heavy machinery traffic | Negative Medium | Negative Low | • All personnel should undergo environmental induction with regards to awareness about speed limits and roadkill; and<br>• All construction vehicles should adhere to a speed limit of maximum 20 km/h to avoid collisions. Appropriate speed control measures and signs must be erected. |
| Agriculture Compliance Statement<br>(Appendix E4) | Loss of agricultural potential by occupation of land | Negative Low | Negative Low | • No mitigation measures based on the low impact significance. |
| Phase 1 Cultural Heritage Assessment (Appendix E5) | Direct or physical impacts, implying alteration or destruction of heritage features | Negative Low | Negative Low | • Known sites should be clearly marked, so that they can be avoided during construction activities.<br>• The contractors and workers should be notified that archaeological sites might be exposed during the construction activities.<br>• Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer (ECO) shall be notified as soon as possible.<br>• All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the ECO will advise the necessary actions to be taken;<br>• Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and |

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| | | | | • Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA, Section 51(1). |
| Palaeontological Impact Assessment<br><br>(Appendix D6) | Disturbance, damage or destruction of legally protected fossil heritage within the development footprint during the construction phase.<br><br>Disturbance of fossils (stromatolites) of the Malmani (Chuniespoort Group, Transvaal Supergroup). | Negative Low | Negative Low | • If fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations the Environmental Control Officer (ECO) in charge of these developments must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation can be carry out by a palaeontologist.<br><br>• If a well-preserved stromatolite outcrop s is uncovered in the development footprint (after vegetation clearance) the stromatolites may be cordoned off and a buffer of 30m may be placed around the outcrop or a reprehensive example should be removed and placed near the offices of the PV as an informative example of fossils in the area. |
| Visual Impact Assessment<br><br>(Appendix D3) | Visual impact of construction activities on sensitive visual receptors in close proximity to the proposed Jersey SPP | Negative Low | Negative Low | Planning<br><br>• Retain and maintain natural vegetation immediately adjacent to the development footprint.<br><br>Construction<br><br>• Ensure that vegetation is not unnecessarily removed during the construction phase.<br><br>• Plan the placement of laydown areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e., in already disturbed areas) where possible. |

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| | | | | • Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.<br>• Ensure that rubble, litter, etc. are appropriately stored (if it can't be removed daily) and then disposed of regularly at a licenced waste site.<br>• Reduce and control dust during construction by utilising dust suppression measures.<br>• Reduce construction activities between 07:00 and 18:00, where possible, in order to reduce the impacts of construction lighting.<br>• Rehabilitate all disturbed areas immediately after the completion of construction work and maintain good housekeeping. |
| Social Impact Assessment<br>(Appendix D7) | Direct and indirect employment opportunities and skills development | Positive Low | Positive Medium | Enhancement:<br>• A local employment policy should be adopted to maximise opportunities made available to the local labour force.<br>• Labour should be sourced from the local labour pool, and only if the necessary skills are unavailable should labour be sourced from (in order of preference) JB Marks LM, greater Dr Kenneth Kaunda DM, North West Province, South Africa, or elsewhere.<br>• Where feasible, training and skills development programmes should be initiated prior to the commencement of the construction phase.<br>• As with the labour force, suppliers should also as far as possible be sourced locally. |

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| | | | | • As far as possible local contractors that are compliant with Broad-Based Black Economic Empowerment (B-BBEE) criteria should be used.<br>• The recruitment selection process should seek to promote gender equality and the employment of women wherever possible. |
| | Economic Multiplier effect | Positive Low | Positive Medium | Enhancement:<br>• It is recommended that a local procurement policy is adopted to maximise the benefit to the local economy.<br>• A database of local companies, specifically Historically Disadvantaged Individuals (HDIs) which qualify as potential service providers (e.g., construction companies, security companies, catering companies, waste collection companies, transportation companies etc.) should be created and companies listed thereon should be invited to bid for project-related work where applicable.<br>• Local procurement is encouraged along with engagement with local authorities and business organisations to investigate the possibility of procurement of construction materials, goods and products from local suppliers where feasible. |
| | Safety and security impacts | Negative Medium | Negative Low | • Working hours should be kept within daylight hours during the construction phase, and / or as any deviation that is approved by the relevant authorities.<br>• Provide transportation for workers to prevent loitering within or near the project site outside of working hours.<br>• The perimeter of the construction site should be appropriately secured to prevent any unauthorised access to the site. The |

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| | | | | fencing of the site should be maintained throughout the construction period.<br>• The appointed EPC Contractor must appoint a security company to ensure appropriate security procedures and measures are implemented.<br>• Access in and out of the construction site should be strictly controlled by a security company appointed to the project.<br>• A CLO should be appointed as a grievance mechanism. A method of communication should be implemented whereby procedures to lodge complaints are set out for the local community to express any complaints or grievances with the construction process.<br>• The EPC Contractor should implement a stakeholder management plan to address neighbouring farmer concerns regarding safety and security.<br>• The project proposed must prepare and implement a Fire Management Plan; this must be done in conjunction with surrounding landowners.<br>• The EPC Contractor must prepare a Method Statement which deals with fire prevention and management. |
| | Nuisance impacts (noise and dust) | Negative Medium | Negative Low | • The movement of heavy vehicles associated with the construction phase should be timed to avoid weekends, public holidays, and holiday periods where feasible.<br>• Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and |

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| | | | | ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers.<br>• Ensure all vehicles are road worthy, drivers are qualified and are made aware of the potential noise and dust issues.<br>• A CLO should be appointed, and a grievance mechanism implemented. |
| | Visual and sense of place impacts | Negative Low | Negative Low | • Implement mitigation measures identified in the Visual Impact Assessment (VIA) prepared for the project.<br>• Limit noise generating activities to normal daylight working hours and avoid weekends and public holidays.<br>• The movement of heavy vehicles associated with the construction phase should be timed to avoid weekends, public holidays, and holiday periods where feasible.<br>• Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers.<br>• All vehicles must be road-worthy, and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.<br>• Communication, complaints, and grievance channels must be implemented and contact details of the CLO must be provided to the local community in the study area. |
| Traffic Impact Assessment | Traffic impacts relating to the construction phase | Negative Medium | Low | • The shift work provides a mitigation and reduces the expected number of employees, especially during peak hours. The magnitude of the |

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| (Appendix D8) | | | | increased traffic is relatively small and is not likely to change during the operational phase of the development. These trips will become part of the network trips due to the development |

### 6.2.2 Impacts during the operational phase

During the operational phase the site will serve as a solar plant. The potential impacts will take place over a period of 20 – 25 years. During the operational phase the following activities will have various potential impacts on the biophysical and socio-economic environment:

- Activity 11(i) (GN.R. 327): "The development of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts."
- Activity 1 (GN.R 325): *"The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more."*
- Activity 4 (h)(iv) (GN.R 324): *"The development of a road wider than 4 metres with a reserve less than 13,5 metres within (h) the North West, (iv) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority".*
- Activity 12 (h)(iv) GN.R 324): *"The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation in (h) North West (iv) within Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority".*
- Activity 18 (h)(v) (GN.R 324): *"The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre in (h) North within (v) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority".*

Table 6.4 summarised the negative impacts are generally associated with the Solar Power Plant (including other associated infrastructure) and power line, which include impacts on the fauna and flora, soils, geology, surface water, the pressure on existing services infrastructure, and visual impacts. The provision of sustainable services delivery also needs to be confirmed. The operational phase will have a direct positive impact through the provision of employment opportunities for its duration, and the generation of income to the local community

**Table 6.4**: Impacts and the mitigation measures during the operational phase

| SPECIALIST STUDY | IMPACT | PRE-MITIGATION RATING | POST MITIGATION RATING | SUMMARY OF MITIGATION MEASURES |
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| Terrestrial Biodiversity Compliance Statement (Appendix E1) | Habitat destruction / fragmentation of fauna habitats | Negative High | Negative Medium | • Refer to Construction Phase mitigation |
| | Soil erosion and sedimentation | Negative Medium | Negative Low | • Refer to Construction Phase mitigation |
| | Spread and establishment of alien invasive plant species | Negative High | Negative Low | • Refer to Construction Phase mitigation |
| | Habitat degradation due to dust | Negative Medium | Negative Low | • Refer to Construction Phase mitigation |
| | Spillages of harmful substances | Negative Medium | Negative Low | • Refer to Construction Phase mitigation |
| Avifaunal Assessment (Appendix E2) | Collisions with infrastructure associated with the PV Facility | Negative High | Negative Low | • The design of the proposed solar plant must be of a type or similar structure as endorsed by the Eskom-Endangered Wildlife Trust (EWT) Strategic Partnership on Birds and Energy, considering the mitigation guidelines recommended by Birdlife South Africa;<br>• Infrastructure should be consolidated where possible in order to minimise the amount of ground and air space |

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| | | | | used. This would involve using existing/approved pylons and associated infrastructure for different lines;<br>• Non-polarising white tape can be used around and/or across panels to minimise reflection (Bennun et al, 2021). This is especially pertinent to waders and aquatic species that may recognise the panel array as water bodies (lake effect as described above) and collide with the panels, causing mortality;<br>• Overhead cables/lines must be fitted with industry standard bird flight diverters in order to make the lines as visible as possible to collision-susceptible species. Shaw et al (2021) demonstrated that large avifauna species mortality was reduced by 51% (95% CI: 23–68%). Recommended bird diverters such as flapping devices (dynamic device) and thickened wire spirals (static device) that increase the visibility of the lines should be fitted 5 m apart. The Inotec BFD88 bird diverter is highly recommended due to its visibility under low light conditions when most species move from roosting to feeding sites;<br>• Fencing mitigations:<br>  ○ Top 2 strands must be smooth wire;<br>  ○ Routinely retention loose wires;<br>  ○ Minimum distance between wires is 300 mm; and<br>• Place markers on fences. |

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| | Electrocution due to infrastructure associated with the PV Facility | Negative Medium | Negative Low | • The design of the proposed solar plant and grid lines 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;<br>• Insulation where energised parts and/or grounded parts are covered with materials appropriate for providing incidental contact protection to birds. It is best to use suspended insulators and vertical disconnectors, if upright insulators or horizontal disconnectors are present, these should be covered; and<br>• Perch discouragers can be used such as perch guards or spikes. Considerable success achieved by providing artificial bird safe perches, which are placed at a safe distance from the energised parts (Prinsen et al, 2012). |
| | Direct mortality from persecution or poaching of avifauna species and collection of eggs | Negative Medium | Negative Low | • All personnel should undergo environmental awareness training that includes educating on not poaching/persecuting avifauna species and collecting eggs; and<br>• Signs must be put up to enforce this, should someone be caught a R1000 fine must be enforced. |
| | Direct mortality by roadkill during maintenance procedures | Negative Medium | Negative Low | • All personnel should undergo environmental induction with regards to awareness about speed limits and roadkill; and<br>• All vehicles should adhere to a speed limit of maximum 20 km/h to avoid collisions. Appropriate speed control measures and signs must be erected. |

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| | Pollution of water sources and surrounding habitat due to cleaning products of the PV panels | Negative High | Negative Low | • Only environmentally friendly chemicals are to be used for cleaning of the panels. |
| | Heat radiation from the PV panels | Negative Medium | Negative Low | • A fire management plan needs to be put in place; and<br>• Grass must be kept under the panels to ensure that additional reflection is not taking place from the surface below the panels |
| | Encroachment of Invasive Alien Plants into disturbed areas | Negative Medium | Negative Low | • An IAP Management Plan must be written and implemented for the development. The developer must contract a specialist to develop the plan and the developer is responsible for its implementation;<br>• Regular monitoring for IAP encroachment during the operation phase to ensure that no alien invasion problems have developed as result of the disturbance. This should be every 3 months during the first two years of the operation phase and every six months for the life of the project; and<br>• All IAP species must be removed/controlled using the appropriate techniques as indicated in the IAP management plan. |
| Visual Impact Assessment<br>(Appendix D3) | Potential visual impacts on sensitive visual receptors located within a 5km radius of the SPP | Negative Medium | Negative Low | Planning<br>• Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint.<br>• Where insufficient natural vegetation exists next to the property, a 'screen' can be planted using endemic, fast growers that are water efficient. |

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| | | | | Operations<br>• Maintain general appearance of the facility as a whole. |
| | Visual impact on observers travelling along the roads and residents at homesteads within a 5-10km radius of the SPP. | Negative Low | Negative Low | Planning<br>• Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint.<br>• Where insufficient natural vegetation exists next to the property, a 'screen' can be planted using endemic, fast growers that are water efficient.<br>Operations<br>• Maintain general appearance of the facility as a whole. |
| | Potential visual impact on residents of farmsteads and motorists in close proximity to proposed facility. | Negative Medium | Negative Low | Planning & Operation<br>• Shield the source of light by physical barriers (walls, vegetation etc.)<br>• Limit mounting heights of lighting fixtures, or alternatively use footlights or bollard level lights.<br>• Make use of minimum lumen or wattage in fixtures.<br>• Make use of down-lighters, or shield fixtures.<br>• Make use of low-pressure sodium lighting or other types of low impact lighting. |

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| | | | | • Make use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes. |
| | Visual impacts of solar glint and glare as a visual distraction and possible air travel hazard. | Negative Low | Negative Low | • No mitigation measures are required. |
| | Visual impact on sensitive visual receptors in close proximity to the 132kV overhead power line | Negative Low | Negative Low | Planning<br>• Retain/re-establish and maintain natural vegetation immediately adjacent to the power line servitude.<br>Operations<br>• Maintain the general appearance of the servitude as a whole. |
| | Visual impact and impacts on sense of place | Negative Low | Negative Low | • The subjectivity towards the project in its entirety can be influenced by creating a "Green Energy" awareness campaign, educating the local community and potentially tourists on the benefits of renewable energy. This can be achieved by also hosting an 'open day' where the local community can have the opportunity to view the completed project which may enlist a sense of pride in the renewable energy project in their area.<br>• Implement good housekeeping measures. |
| | Direct and Indirect employment | Positive Low | Positive Medium | Enhancement: |

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| Social Impact Assessment<br>(Appendix E7) | opportunities and skills development | | | • It is recommended that local employment policy is adopted to maximise the opportunities made available to the local community.<br>• The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.<br>• Vocational training programs should be established to promote the development of skills. |
| | Development of non-polluting, renewable energy infrastructure | Positive Medium | Positive Medium | • No enhancement identified |
| | Potential loss of agricultural land | Negative Medium | Negative Low | • The proposed mitigation measures for the construction phase should have been implemented at this stage.<br>• Mitigation measures from the Agricultural and Soil Report, should also be implemented. |
| | Contribution to Local Economic Development (LED) and social upliftment | Positive Medium | Positive High | Enhancement:<br>• A CNA must be conducted to ensure that the LED and social upliftment programmes proposed by the project are meaningful.<br>• Ongoing communication and reporting are required to ensure that maximum benefit is obtained from the programmes identified, and to prevent the possibility for such programmes to be misused.<br>• The programmes should be reviewed on an ongoing basis to ensure that they are best suited to the needs |

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| | | | | | | of the community at the time (bearing in mind that these are likely to change over time). |
| | Impact on tourism | Negative Low | Positive Low | Negative Low | Positive Low | • The impact rating is dependent on how the development is perceived by tourism. In some cases, renewable energy developments can be seen as an addition to the tourist industry in the area (positive low) or it can be viewed as a negative. The rating is subjective.<br>• Due to the extent of the project no viable mitigation measures can be implemented to eliminate the visual impact of the PV panels, but the subjectivity towards the PV panels can be influenced by creating a "Green Energy" awareness campaign, educating the local community and tourists on the benefits of renewable energy. Tourists visiting the area should be made aware of South Africa's movement towards renewable energy. This might create a positive feeling of a country moving forward in terms of environmental sustainability. This could be implemented by constructing a visitor's centre on the property allocated to the proposed solar farm which should be open to school fieldtrips, the local community, and tourists |
| | Visual and sense of place impacts | Negative Low | | Negative Low | | • To effectively mitigate the visual impact and the impact on sense of place during the operational phase of the proposed Jersey SPP, it is suggested that the recommendations made in the Visual Impact Assessment (specialist study) should be followed in this regard |

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| Traffic Impact Assessment<br><br>(Appendix E8) | Increased commuter traffic | Negative Low | Low | • The shift work provides a mitigation and reduces the expected number of employees, especially during peak hours. The magnitude of the increased traffic is relatively small and is not likely to change during the operational phase of the development. These trips will become part of the network trips due to the development |

### 6.2.3 Impacts during the decommissioning phase

The physical environment will benefit from the closure of the solar facility since the site will be restored to its natural state. Table 6.5 provides a summary of the impacts during the decommissioning phase. The decommissioning phase will however potentially result in impact on soils, pressure on existing service infrastructure, and the loss of permanent employment. Skilled staff will be eminently employable, and a number of temporary jobs will also be created in the process. Decommissioning of a PV facility will leave a positive impact on the habitat and biodiversity in the area as the area will be rehabilitated to its natural state.

**Table 6.5:** Impacts and the mitigation measures during the decommissioning phase

| SPECIALIST STUDY | IMPACT | PRE-MITIGATION RATING | POST MITIGATION RATING | SUMMARY OF MITIGATION MEASURES |
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| Terrestrial Biodiversity Compliance Statement (Appendix E1) | Improvement of habitat through revegetation / succession over time | Negative Low | Negative Low | • Undeveloped areas that were degraded due to human activities must be rehabilitated. |
| | Spillages of harmful substances | Negative Low | Negative Low | • Hazardous chemicals must be stored on an impervious surface and protected from the elements. These chemicals must be strictly controlled, and records kept of when it was used and by whom. |
| | Spread and establishment of alien invasive species | Negative Low | Negative Low | • Any alien plants observed must be reported to the environmental manager and must be removed as soon as possible |
| Traffic Impact Assessment (Appendix E8) | Increased traffic. | Negative Low | N/A | • The shift work provides a mitigation and reduces the expected number of employees, especially during peak hours. The magnitude of the increased traffic is relatively small and is not likely to change during the operational phase of the development. These trips will become part of the network trips due to the development |

**Table 6.6:** Impacts and the mitigation measures associated with the Battery Energy Storage System (BESS)

| IMPACT | PRE-MITIGATION RATING | POST MITIGATION RATING | SUMMARY OF MITIGATION MEASURES |
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| Mechanical breakdown / Exposure to high temperatures<br><br>Fires, electrocutions and spillage of toxic substances into the surrounding environment.<br><br>Spillage of hazardous substances into the surrounding environment.<br><br>Soil contamination – leachate from spillages which could lead to an impact of the productivity of soil forms in affected areas.<br><br>Water Pollution – spillages into surrounding watercourses as well as groundwater. | Negative Medium | Negative Low | • Potential impact of electrolyte spills on groundwater;<br>• Suitable disposal of waste and effluent;<br>• Key measures in the EMPr relevant to worker's activities;<br>• How incidents and suggestions for improvement can be reported.<br>• Training records should be kept on file and be made available during audits.<br>• Battery supplier user manuals safety specifications and Material Safety Data Sheets (MSDS) are filed on site at all times.<br>• Compile method statements for approval by the Technical/SHEQ Manager for the operation and management and replacement of the battery units / electrolyte for the duration of the project life cycle. Method statements should be kept on site at all times.<br>• Provide signage on site specifying the types of batteries in use and the risk of exposure to harzardous material and electric shock. Signage should also specify how electrical and chemical fires should be dealt with by first responders, and the potential risks to first responders (e.g. the inhalation of toxic fumes, etc.).<br>• Firefighting equipment should readily be available at the BESS area and within the site.<br>• Maintain strict access control to the BESS area.<br>• Ensure all maintenance contractors / staff are familiar with the supplier's specifications.<br>• Undertake daily risk assessment prior to the commencement of daily tasks at the BESS. This should consider any aspects which could result in fire or spillage, and appropriate actions should be taken to prevent these. |

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| Health impacts – on the surrounding communities, particularly those relying on watercourses (i.e. rivers, streams, etc) as a primary source of water.<br><br>Generation of hazardous waste. | | | • Standard Operating Procedures (SOPs) should be made available by the Supplier to ensure that the batteries are handled in accordance with required best practices.<br>• Spill kits must be made available to address any incidents associated with the flow of chemicals from the batteries into the surrounding environment.<br>• The assembly of the batteries on-site should be avoided as far as possible. Activities on-site for the BESS should only be limited to the placement of the container wherein the batteries are placed.<br>• Undertake periodic inspections on the BESS to ensure issues are identified timeously and addressed with the supplier where relevant.<br>• The applicant in consultation with the supplier must compile and implement a Leak and Detection Monitoring Programme during the project life cycle of the BESS.<br>• Batteries must be strictly maintained by the supplier or suitably qualified persons for the duration of the project life cycle. No unauthorised personnel should be allowed to maintain the BESS.<br>• Damaged and used batteries must be removed from site by the supplier or any other suitably qualified professional for recycling or appropriate disposal.<br>• The applicant should obtain a cradle to grave battery management plan from the supplier during the planning and design phase of the system. The plan must be kept on site and adhered to. |

## 6.3 SUMMARY OF RECOMMENDATIONS FROM SPECIALIST STUDIES

To address the key issues highlighted in the previous section the following specialist studies and processes were commissioned:

- Ecological and Wetland Assessment – The Biodiversity Company (see Appendix E1)
- Avifaunal Impact Assessment – The Biodiversity Company (see Appendix E2)
- Visual Impact Assessment – Donaway Environmental (see Appendix E3)
- Heritage Impact Assessment – JA van Schalkwyk (see Appendix E6)
- Palaeontological Impact Assessment – Banzai Environmental (Pty) Ltd (see Appendix E7)
- Social Impact Assessment – Donaway Environmental (see Appendix E8)
- Traffic Impact Assessment – Bvi Consulting Engineers (see Appendix E9)
- Agricultural Compliance Statement – The Biodiversity Company (see Appendix E4)
- A detailed assessment of the cumulative impacts associated with the proposed development – conducted by the lead consultant, Environamics, in conjunction with the project specialists (refer to Section 7 of this report).

The following sections summarise the main findings from the specialist reports in relation to the key issues raised during the scoping phase.

### 6.3.1 Heritage and archaeological impacts

South Africa's heritage resources comprise a wide range of sites, features, objects and beliefs. According to Section 27(18) of the National Heritage Resources Act (NHRA), No. 25 of 1999, no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such sites. In accordance with Section 38 of the NHRA, an independent heritage consultant was therefore appointed to conduct a Heritage Impact Assessment (HIA) to determine if any sites, features or objects of cultural heritage significance occur within the proposed site. The main question which needs to be addressed is:

"Will the proposed development impact on any heritage or archaeological artefacts?"

The Heritage Impact Assessment (Refer to Appendix E6) confirmed the following:

From a review of the available old maps and aerial photographs it can be seen that the project area has always been open space, with the main activity being grazing or the making of agricultural fields. No built structures are visible in the project area. Some old diamond prospecting pits are located to the western boundary of the project area.

For this proposed project, the assessment has determined that no sites, features or objects of cultural heritage significance occur in the project area, therefore no permits are required from SAHRA or the PHRA.

If heritage features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision will be made regarding the application for relevant permits.

From a heritage point of view, it is recommended that the Jersey Solar Power Plant be allowed to continue on acceptance of the conditions proposed below.

### 6.3.2 Ecological Impacts

The potential impact of the proposed development on threatened flora and fauna known to occur in the North West Province had to be determined. The main question which needs to be addressed is:

"How will the proposed development impact on the ecology?"

The Terrestrial Biodiversity Compliance Statement (refer to Appendix E1) stated that considering the fact that anthropogenic activities have historically taken place throughout most of the region, and continue to do so, several significantly negative impacts to biodiversity were observed within and adjacent to the project area. These include:

- Historic land modification largely in the form of road and powerline infrastructure, and the associated land clearing and edge effects;
- Livestock grazing;
- Minor and major gravel roads (and associated vehicle traffic and the possibility of wildlife road mortalities);
- Invasive Alien Plant infestations; and
- Fences and the associated infrastructure.

The proposed activities are likely to be of a medium impact and will result in the loss of the following important ecological resources:

- Ecological Support Area; and
- Indigenous vegetation.

The majority of the project area comprised of grassland, which has been impacted upon by anthropogenic related activities and retains a medium level of functionality. As such the recommendations put forward by the specialist at the end of this report must be implemented and mitigations must be put in place and implemented to prevent the total destruction and loss of all local natural resources.

The majority of the project area comprised of grassland, which has been impacted upon by anthropogenic related activities, but serves as an important greenfields area that supports indigenous flora and fauna, including protected species. As such it is important that the management outcomes presented above be adhered to, in order to properly mitigate the negative environmental impacts that will stem from the project activities.

Two fauna SCC were recorded, *Hippotragus niger* (Sable Antelope) and *Equus quagga* (Plains Zebra), which is considered to be introduced to the area since portions of the project area is utilised as a game farm. Additionally, the following species that were recorded across the project area is listed as protected under Schedule 2 of the North West Biodiversity Management Act No 4 (2016); *Connochaetes taurinus* (Blue Wildebeest), *Damaliscus pygargus phillipsi* (Blesbok), *Equus quagga* (Plains Zebra), *Hippotragus niger* (Sable Antelope), and *Tragelaphus oryx* (Common Eland).

Completion of the terrestrial biodiversity assessment led to a disputing of the 'Very High' classification for the terrestrial biodiversity theme sensitivity as allocated by the National Environmental Screening Tool. The project area is instead assigned an overall sensitivity of 'Medium' and 'Very Low'.

The portion of land within the project area that is classified as having a sensitivity rating of 'Very Low', namely the transformed, degraded habitat, and alien woodland is likely to face minimal further impacts from any development activities, and as such the proposed activities may proceed within these areas.

As per the SEI guidelines, only development activities of medium impact followed by appropriate restoration activities will be acceptable within the areas designated as medium sensitivity (Grassland). As such it is imperative that the mitigation measures mentioned in this report be implemented and adhered to.

### 6.3.3 Avifaunal Impacts

The potential impact of the proposed development on birds known to occur in North West Province had to be determined. The main question which needs to be addressed is:

"How will the proposed development impact on the avifauna?"

According to the Avifaunal Impact Assessment (Appendix E2) considering that there are anthropogenic activities and influences present within the landscape, there are currently several negative impacts to biodiversity, including avifauna. These include:

- Historic land modification largely in the form of road and powerline infrastructure, and the associated land clearing and edge effects;
- Livestock grazing;
- Minor and major gravel roads (and associated vehicle traffic and the possibility of wildlife road mortalities);
- Invasive Alien Plant infestations; and
- Fences and the associated infrastructure.

During the construction phase vegetation clearing for the associated infrastructure will lead to direct habitat loss. Vegetation clearing will create a disturbance and will therefore potentially lead to the displacement of avifaunal species. The operation of construction machinery on site will generate noise pollution. Increased human presence can lead to poaching and the increase in vehicle traffic and heavy machinery will potentially lead to roadkill.

The principal impacts of the operational phase are electrocution, collisions, fencing, chemical pollution due to chemical cleaning of the PV panels and habitat loss. Solar panels have been implicated as a potential risk for bird collisions. Collisions are thought to arise when birds (particularly waterbirds) mistake the panels for waterbodies, known as the "lake effect" (Lovich & Ennen, 2011), or when migrating or dispersing birds become disorientated by the polarised light reflected by the panels. This "lake-effect" hypothesis has not been substantiated or refuted to date (Visser et al, 2019). It can however be said that the combination of power lines, fencing and large infrastructure will influence avifauna species. Visser et al (2019) performed a study at a utility-scale PV SEF in the Northern Cape

and found that most of the species affected by the facility were passerine species. This is due to collisions with solar panels from underneath. During a predator attack while foraging under the panels, individuals may alight and then collide with the panel. Larger species were said to be more influenced by the facilities when they were found foraging close by and were disturbed by predators which resulted in collisions with infrastructure.

Large passerines are particularly susceptible to electrocution because owing to their relatively large bodies, they are able to touch conductors and ground/earth wires or earthed devices simultaneously. The chances of electrocution are increased when feathers are wet, during periods of high humidity or during defecation. Prevailing wind direction also influences the rate of electrocution casualties.

Fencing of the PV site can influence birds in six ways (BirdLife South Africa, 2015):

- Snagging – occurs when a body part is impaled on one or more barbs or razor points of a fence;
- Snaring – when a bird's foot/leg becomes trapped between two overlapping wires;
- Impact injuries – birds flying into a fence, the impact may kill or injure the bird;
- Snarling – when birds try and push through a mesh or wire stands, ultimately becoming trapped (uncommon);
- Electrocution – electrified fence can kill or severely injure birds; and
- Barrier effect – fences may limit flightless birds including moulting waterfowl from resources.

Chemical pollution from PV cleaning, if not environmentally friendly will result in either acute or chronic affects. Should this chemical penetrate into the surrounding environment, it would impact populations on a larger scale and not just species found in and around the PV footprint.

During the assessment one SCC was observed, the Cape Vulture regionally listed as EN and nationally as VU. These birds were recorded during both surveys and based on personal communications with the farm owner can be found utilising the farm dams near the kraal. In order to determine if this is the case, the farm dams must be monitored with camera traps prior to the commencement of the project. If it is determined that they do use the dams an artificial alternative dam will need to be constructed outside of the project area. Fifteen and eight priority species respectively were recorded in the first and second survey. These species are at risk of either habitat loss, collisions or electrocutions. If the mitigations and recommendations are implemented these risks can be reduced to low.

Mitigation measures as described in this report can be implemented to reduce the significance of the risk to an acceptable residual risk level. Considering the above-mentioned information, it is the opinion of the specialist that the project may be favourably considered, on condition that all the mitigation, monitoring and recommendations provided in this report and other specialist reports are implemented

### 6.3.4 Visual Impacts

Due to the extent of the proposed photovoltaic solar plant it is expected that the plant will result in potential visual impacts. The main question which needs to be addressed is:

"To what extent will the proposed development be visible to observers and to will the landscape provides any significant visual absorption capacity"

The Visual Impact Assessment (Refer to Appendix E3) concluded that the post mitigation impact is a "*Negative Low*" impact during the construction, decommissioning and operational phases. The only receptors likely to be impacted by the proposed development are the nearby property owners and road users on nearby roads. The visual landscape is already degraded due to the large number of mines and Eskom electricity infrastructure in the area.

The construction and operational phases of the Jersey SPP and its associated infrastructure, may have a visual impact on the area, especially within (but not restricted to) a 5km radius of the proposed SPP. The visual impact will differ amongst places, depending on the distance of the SPP.

Due to the height of the power line (32m) and extent of the project, no viable mitigation measures can be implemented to eliminate the visual impact of the PV facility and power lines, but the possible visual impacts can be reduced. A number of mitigation measures have however been proposed regardless of whether or not mitigation measures will reduce the significance of the of the anticipated impacts, they are considered good practice and should be implemented and maintained throughout the construction, operational and decommissioning phases of the project.

In terms of possible landscape degradation, the landscape does not appear to have any specific protection or importance and is characterised by agricultural activities. No buffer areas or areas to be avoided are applicable for this development.

Taking into account all positive factors of such a development including economic factors, social factors and sustainability factors, especially in an arid country, and the industrialised and degraded landscape, the visual impact of this proposed development will be insignificant and is suggested that the development commence, from a visual impact point of view. The specialist recommends that the details of the power line be submitted with the South African Civil Aviation Authority (SACAA).

The specialist recommends that the project be approved from a visual perspective.

### 6.3.5 Agricultural / impacts on the soil

In order to determine the potential impacts that the proposed development will have on agricultural production, the soil forms and current land capability of the area where the proposed project will be situated a soil survey has been conducted. The main question which needs to be addressed is:

"How will the proposed development impact on agricultural resources and the soil?"

The Agricultural Compliance Statement (Appendix E4) indicated that the most sensitive soil forms identified within the project area is the Vaalbos and Hutton soil forms. The land capability sensitivities (DAFF, 2017) indicate land capabilities with "Very Low to Moderate" sensitivities, which correlates with the findings from the baseline assessment. The overall sensitivity of the assessment area is categorized as "Low" which also conforms to the DEA, (2022) agricultural sensitivity themes.

The project area is associated with non-arable lands. The available climate limits crop production significantly. The harsh climatic conditions are associated with low annual rainfall and high evapotranspiration potential demands of the area, which consequently result into a very restricted

choice of crops due to the heat and moisture stress. The area is not favourable for most cropping practices, which corresponds to the current livestock and game farming activities in the area.

It is the specialist's opinion that the proposed Jersey SPP project and associated infrastructure will have limited impacts on the agricultural production ability of the land. There is no segregation of any crop fields with a high production capability within the project assessment area. It is, therefore, the specialist`s recommendation that the proposed Jersey SPP project and associate infrastructure may be favourably considered for development with no significant impacts expected to occur. And therefore, no specific mitigation measures are required to be implemented.

### 6.3.6 Socio-economic impacts

A Social Impact Assessment has been compiled in order to provide a description of the environment that may be affected by the activity and the manner in which the environment may be affected by the proposed facility; to provide a description and assessment of the potential social issues associated with the proposed facility; and the identification of enhancement and mitigation aimed at maximizing opportunities and avoiding and or reducing negative impacts (refer to Appendix H8). The main question which needs to be addressed is:

"How will the proposed development impact on the socio-economic environment?"

The findings of the SIA (Refer to Appendix E7) indicate that there are some vulnerable communities within the area that may be affected by the development of the Jersey SPP and its associated infrastructure. Traditionally, the construction phase of a SPP is associated with most social impacts. Many of the social impacts are unavoidable and will take place to some extent but can be managed through the careful planning and implementation of appropriate mitigation measures. Several potential positive and negative social impacts have been identified for the project, however an assessment of the potential social impacts indicated that there are no perceived negative impacts that are sufficiently significant to allow them to be classified as "fatal flaws.

The potential negative social impacts associated with the construction phase are typical of construction related projects and not just focussed on the construction of solar PV projects (these relate to an influx of non-local workforce and jobseekers, intrusion, and disturbance impacts (i.e., noise and dust, wear and tear on roads) and safety and security risks) and could be reduced with the implementation of the mitigation measures proposed. The significance of such impacts on the local communities can therefore be mitigated.

The development will introduce employment opportunities during the construction phase (temporary employment) and a limited number of permanent employment opportunities during operation phase.

The proposed project could assist the local economy in creating entrepreneurial growth and opportunities, especially if local business is involved in the provision of general material, goods and services during the construction and operational phases.

The proposed development also represents an investment in infrastructure for the generation of non-polluting, Renewable Energy, which, when compared to energy generated because of burning polluting fossil fuels, represents a positive social benefit for society.

It should be noted that the perceived benefits associated with the project, which include Renewable Energy generation and local economic and social development, outweigh the perceived negative impacts associated with the project.

The specialist concludes that the project, and its associated infrastructure, will be unlikely to result in permanent damaging social impacts, and therefore from a social perspective the project can be development subject to the implementation of the recommended mitigation measures.

### 6.3.7 Paleontological Impacts

South Africa's heritage resources comprise a wide range of sites, features, objects and beliefs. According to Section 27(18) of the National Heritage Resources Act (NHRA), No. 25 of 1999, no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site. The main question which needs to be addressed is:

"How will the proposed development impact on the Palaeontological resources?"

According to the Palaeontological Impact Assessment (Appendix E6) the proposed Jersey Solar Power Plant is underlain by the Precambrian dolomites and associated marine sedimentary rocks of the Malmani Subgroup (Chuniespoort Group, Transvaal Supergroup). According to the PalaeoMap of the South African Heritage Resources Information System (SAHRIS) the Palaeontological Sensitivity of the Malmani Subgroup (Chuniespoort Group, Transvaal Supergroup) is Very High (Almond et al, 2013; SAHRIS website) while Groenewald et al (2014) allocated a High Sensitivity to the Malmani Subgroup in the Palaeotechnical report of the Northwest Province.

The Jersey SPP underlain by the Precambrian dolomites and associated marine sedimentary rocks of the Monte Christo and Lyttleton Formations (Malmani Subgroup, Chuniespoort Group, Transvaal Supergroup). Updated geology (mapped by the Council of Geosciences, Pretoria) indicates that the Malmani Subgroup is represented in the Jersey SPP footprint. The Palaeotechnical Report of the North West Province (Groenewald et al, 2014) allocates a High Palaeontological Sensitivity to the Malmani Subgroup. In contrast, the PalaeoMap of the South African Heritage Resources Information System (SAHRIS) indicates that the Palaeontological Sensitivity of the Malmani Subgroup is Very High (Almond et al, 2013; SAHRIS website).

A site-specific field survey of the development footprint was conducted on foot and by motor vehicle on 3 October 2022. Outcrops of weathered to fairly well-preserved stromatolites were discovered on the development. Mitigation of a sample of well-preserved stromatolites is thus recommended. By implementing mitigation measures the significance of the impact will be reduced to Low. Mitigation should take place after initial vegetation is cleared away but before the ground is levelled for construction. These recommendations should be included in the Environmental Management Plan of the Jersey Solar Power Plant.

Recommendations:

- The ECO must be made aware that fossils (stromatolites) of the Malmani (Chuniespoort Group, Transvaal Supergroup) has a High to Very High Palaeontological Significance.

- If a well-preserved stromatolite outcrop s is uncovered E6 the development footprint (after vegetation clearance) the stromatolites may be cordoned off and a buffer of 30m may be placed around the outcrop or a reprehensive example should be removed and placed near the offices of the PV as an informative example of fossils in the area.

### 6.3.8 Traffic Impacts

Large developments are normally associated with an increase in construction vehicle traffic. The main question which needs to be addressed is:

"How will the proposed development impact on the traffic on main delivery routes to the site?"

According to the Traffic Impact Assessment (Appendix H9) The major traffic impact occurs during the construction phase of the project. The impact of the construction trip generation, on the predicted traffic volumes on the local and the regional transportation routes are expected to be low. No mitigation measures for these routes will be necessary. Two possible ports of entry have been identified from where the solar panel technology and large electrical components will be transported, namely: Durban (700 km) and Richards Bay (723 km). It is recommended that the Port of Durban is the preferred port of entry as this route is the shorter of the two routes. The regional routes indicated in the analysis would need to be confirmed by freight carriers as suitable for the sensitive normal loads. The final decision on the selected route would be based on a combination of cost, distance and road condition at the time of transport.

Transformer and substation components will be transported via abnormal loads. An abnormal load will necessitate an application to the Department of Transport and Public Works for a permit. A permit is required for each province that the transportation route traverses. Only one to two abnormal load trips are expected for the Jersey PV SPP development. Abnormal load transportation is therefore considered to be isolated and would have a negligible impact on traffic over the construction phase of the project.

In terms of impact on roads infrastructure the access to the site is proposed via a Class 4 Rural local connector road, D1822.Three different access alignment alternatives are proposed and are spaced approximately 30 m apart. Proposed Access Alignment Alternative 1 and 2 require varying amounts of horizontal deflection between the D1822 and the proposed site access road, while Proposed Access Alignment Alternative 3 has a straight connection.

All three proposed alignment alternatives satisfy the minimum access spacing requirements as per TRH26. The positioning of the preferred alignment should, however, consider the placement of opposing accesses as TRH26 states that access points are preferred opposite each other (instead of a series of staggered intersections).

All three proposed access alignment alternatives are considered viable and a final decision on the positioning of the access can therefore include consideration for various other (potential) aspects e.g. operational, planning, and cost, etc. The formalisation of the site access point will likely be a requirement as part of the wayleave approval of the local and provincial roads authorities. Adequate traffic accommodation signage must be erected and maintained on either side of the access throughout the construction period of the project.

Therefore, the development of the Jersey Solar Power Plant can be supported from a traffic perspective.

### 6.3.9 Risk Assessment for battery storage system

Battery storage facilities are a relatively new technology, particularly in South Africa. Batteries, as with most electrical equipment, can be dangerous and may catch fire, explode or leak dangerous pollutants if damaged, possibly injuring people working at the facility or polluting the environment. Common failure scenarios of Li-ion batteries include: electrical, mechanical, and thermal. The potential hazards associated with them are fire with consequent emission of gas and explosion. The major risks include thermal runaway, difficulty of fighting battery fires, failure of control systems and the sensitivity of Li-ion batteries to mechanical damage and electrical transients.

As with any fire or explosion, a potential consequence of Li-ion battery fires is the endangerment of life and property. These consequences are assessed based on their severity and likelihood. First, the severity of this consequence changes based on the quantity of cells in a system, as well as the system's proximity to people and property. Therefore, the size and location of the installation should be taken into consideration. For the Jersey SPP the location of the BESS and the fact that the area is sparsely populated will reduce the risk associated with toxic chemicals, flammability and overpressure from explosions. The risk level is seen to be of a low risk that is unlikely to occur with the proper safety measures taken as mitigation. Provided that the facility is designed and managed properly, and the batteries are handled in the manner prescribed by the manufacturer, an incident is unlikely to happen. However, because of the risk special management actions are recommended in the EMPr to reduce the risk of an incident and manage an incident should one ever occur.

## 6.4 SENSITIVITY ANALYSIS

The sensitivity analysis undertaken as part of the EIA Report focusses on providing an understanding of the environmentally sensitive areas and features identified within the SPP site, as well as the grid connection corridor alternatives. This section considers the findings of each of the independent specialist studies undertaken for the development and describes the sensitive features and areas identified, including the location, the sensitivity rating of the features or areas as well as the associated buffers recommended by the specialist (where a buffer is considered to be relevant). The sensitive areas and features identified are also displayed on the sensitivity map included as Figure H1-H6 of this EIA Report.

The following points below provide the sensitivity analysis for the Jersey SPP:

*Terrestrial Biodiversity:*

From a Terrestrial Biodiversity perspective (Terrestrial Biodiversity Compliance Statement, Appendix E1) no specific areas of sensitivity have been identified Therefore, from an Ecological perspective, no areas have been identified as no-go for the development of the SPP and associated infrastructure.

*Avifauna:*

No specific areas of sensitivity have been identified from an avifauna perspective (Avifauna Impact Assessment, Appendix E2). Therefore, from an avifauna perspective, no areas have been identified as no-go for the development of the SPP and associated infrastructure.

*Visual:*

No specific areas of sensitivity have been identified from a visual perspective (Visual Impact Assessment, Appendix E3). Therefore, from a visual perspective, no areas have been identified as no-go for the development of the SPP and associated infrastructure.

*Heritage:*

From a heritage (archaeological) perspective (Heritage Impact Assessment, Appendix E5), no specific areas of sensitivity have been identified. Therefore, no areas have been identified as no-go for the development of the SPP and associated infrastructure.

*Palaeontology:*

The palaeontological sensitivity of the SPP, and the two grid connection corridor options have been confirmed as being of a **low** sensitivity (Palaeontological Impact Assessment, Appendix E6). No palaeontological no-go areas or fossil sites have been identified for the project. Therefore, from a palaeontological perspective, no areas have been identified as no-go for the development of the SPP and associated infrastructure.

*Social:*

No specific areas of sensitivity have been identified from a social perspective (Social Impact Assessment, Appendix E7). Therefore, from a social perspective, no areas have been identified as no-go for the development of the SPP and associated infrastructure.

*Traffic:*

No specific areas of sensitivity have been identified from a traffic perspective (Traffic Impact Assessment, Appendix E8). Therefore, from a traffic perspective, no areas/road aspects have been identified as no-go for the development of the SPP and associated infrastructure.

*Agriculture:*

The agricultural sensitivity of the SPP as being of a **low and medium** sensitivity (Agricultural Compliance Statement, Appendix E4). The site has low agricultural potential due to soil constraints, including shallow soils on underlying bedrock, which makes the site unsuitable for cultivation. Therefore, agricultural land use is limited to grazing. No specific areas of sensitivity have been identified by the specialist that needs to be considered for the placement of infrastructure. Therefore, from an agricultural perspective, no areas have been identified as no-go for the development of the SPP and associated infrastructure.

## 6.5 METHOD OF ENVIRONMENTAL ASSESSMENT

The environmental assessment aims to identify the various possible environmental impacts that could results from the proposed activity. Different impacts need to be evaluated in terms of its significance and in doing so highlight the most critical issues to be addressed.

Significance is determined through a synthesis of impact characteristics which include context and intensity of an impact. Context refers to the geographical scale i.e. site, local, national or global whereas intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence. Significance is calculated as shown in Table 6.6.

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

### 6.5.1 Impact Rating System

Impact assessment must take account of the nature, scale and duration of impacts on the environment whether such impacts are positive or negative. Each impact is also assessed according to the project phases:

- planning
- construction
- operation
- decommissioning

Where necessary, the proposal for mitigation or optimisation of an impact should be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance should also be included. The rating system is applied to the potential impacts on the receiving environment and includes an objective evaluation of the mitigation of the impact. In assessing the significance of each impact, the following criteria is used:

**Table 6.6: The rating system**

| NATURE | | |
|---|---|---|
| Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity. | | |
| GEOGRAPHICAL EXTENT | | |
| This is defined as the area over which the impact will be experienced. | | |
| 1 | Site | The impact will only affect the site. |
| 2 | Local/district | Will affect the local area or district. |

| | | |
|---|---|---|
| 3 | Province/region | Will affect the entire province or region. |
| 4 | International and National | Will affect the entire country. |
| PROBABILITY | | |
| This describes the chance of occurrence of an impact. | | |
| 1 | Unlikely | The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence). |
| 2 | Possible | The impact may occur (Between a 25% to 50% chance of occurrence). |
| 3 | Probable | The impact will likely occur (Between a 50% to 75% chance of occurrence). |
| 4 | Definite | Impact will certainly occur (Greater than a 75% chance of occurrence). |
| DURATION | | |
| This describes the duration of the impacts. Duration indicates the lifetime of the impact as a result of the proposed activity. | | |
| 1 | Short term | The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase (0 – 1 years), or the impact will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years). |
| 2 | Medium term | The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years). |
| 3 | Long term | The impact and its effects will continue or last for the entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years). |
| 4 | Permanent | The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite. |
| INTENSITY/ MAGNITUDE | | |

| | | |
|---|---|---|
| Describes the severity of an impact. | | |
| 1 | Low | Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible. |
| 2 | Medium | Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity). |
| 3 | High | Impact affects the continued viability of the system/ component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation. |
| 4 | Very high | Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired. Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation. |
| REVERSIBILITY | | |
| This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity. | | |
| 1 | Completely reversible | The impact is reversible with implementation of minor mitigation measures. |
| 2 | Partly reversible | The impact is partly reversible but more intense mitigation measures are required. |
| 3 | Barely reversible | The impact is unlikely to be reversed even with intense mitigation measures. |
| 4 | Irreversible | The impact is irreversible and no mitigation measures exist. |
| IRREPLACEABLE LOSS OF RESOURCES | | |
| This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity. | | |
| 1 | No loss of resource | The impact will not result in the loss of any resources. |

| | | |
|---|---|---|
| 2 | Marginal loss of resource | The impact will result in marginal loss of resources. |
| 3 | Significant loss of resources | The impact will result in significant loss of resources. |
| 4 | Complete loss of resources | The impact is result in a complete loss of all resources. |
| CUMULATIVE EFFECT | | |
| This describes the cumulative effect of the impacts. A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question. | | |
| 1 | Negligible cumulative impact | The impact would result in negligible to no cumulative effects. |
| 2 | Low cumulative impact | The impact would result in insignificant cumulative effects. |
| 3 | Medium cumulative impact | The impact would result in minor cumulative effects. |
| 4 | High cumulative impact | The impact would result in significant cumulative effects |
| SIGNIFICANCE | | |

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The calculation of the significance of an impact uses the following formula: (Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity.

The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.

| Points | Impact significance rating | Description |
|---|---|---|
| 6 to 28 | Negative low impact | The anticipated impact will have negligible negative effects and will require little to no mitigation. |
| 6 to 28 | Positive low impact | The anticipated impact will have minor positive effects. |
| 29 to 50 | Negative medium impact | The anticipated impact will have moderate negative effects and will require moderate mitigation measures. |
| 29 to 50 | Positive medium impact | The anticipated impact will have moderate positive effects. |

| | | |
|---|---|---|
| 51 to 73 | Negative high impact | The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact. |
| 51 to 73 | Positive high impact | The anticipated impact will have significant positive effects. |
| 74 to 96 | Negative very high impact | The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws". |
| 74 to 96 | Positive very high impact | The anticipated impact will have highly significant positive effects. |

# 7 CUMULATIVE EFFECTS ASSESSMENT

This section aims to address the requirements of Section 2 of the NEMA to consider cumulative impacts as part of any environmental assessment process.

## 7.1 Introduction

The EIA Regulations (as amended in 2017) determine that cumulative impacts, "in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities." Cumulative impacts can be incremental, interactive, sequential or synergistic. EIAs have traditionally failed to come to terms with such impacts, largely as a result of the following considerations:

- Cumulative effects may be local, regional or global in scale and dealing with such impacts requires coordinated institutional arrangements;
- Complexity - dependent on numerous fluctuating influencing factors which may be completely independent of the controllable actions of the proponent or communities; and
- Project level investigations are ill-equipped to deal with broader biophysical, social and economic considerations.

Despite these challenges, cumulative impacts have been afforded increased attention in this draft EIR and for each impact a separate section has been added which discusses any cumulative issues, and where applicable, draws attention to other issues that may contextualise or add value to the interpretation of the impact. This chapter analyses the proposed project's potential cumulative impacts in more detail by: (1) defining the geographic area considered for the cumulative effects analysis; (2) providing an overview of relevant past and present actions in the project vicinity that may affect cumulative impacts; (3) presenting the reasonably foreseeable actions in the geographic area of consideration; and (4) determining whether there are adverse cumulative effects associated with the resource areas analysed.

The term "Cumulative Effect" has for the purpose of this report been defined as: the summation of effects over time which can be attributed to the operation of the Project itself, and the overall effects on the ecosystem of the SPP site that can be attributed to the Project and other existing and planned future projects.

## 7.2 Geographic Area of Evaluation

The geographic area of evaluation is the spatial boundary in which the cumulative effects analysis was undertaken. The spatial boundary evaluated in these cumulative effects analysis generally includes an area of a 30km radius surrounding the proposed development – refer to Figure 7.1 below.

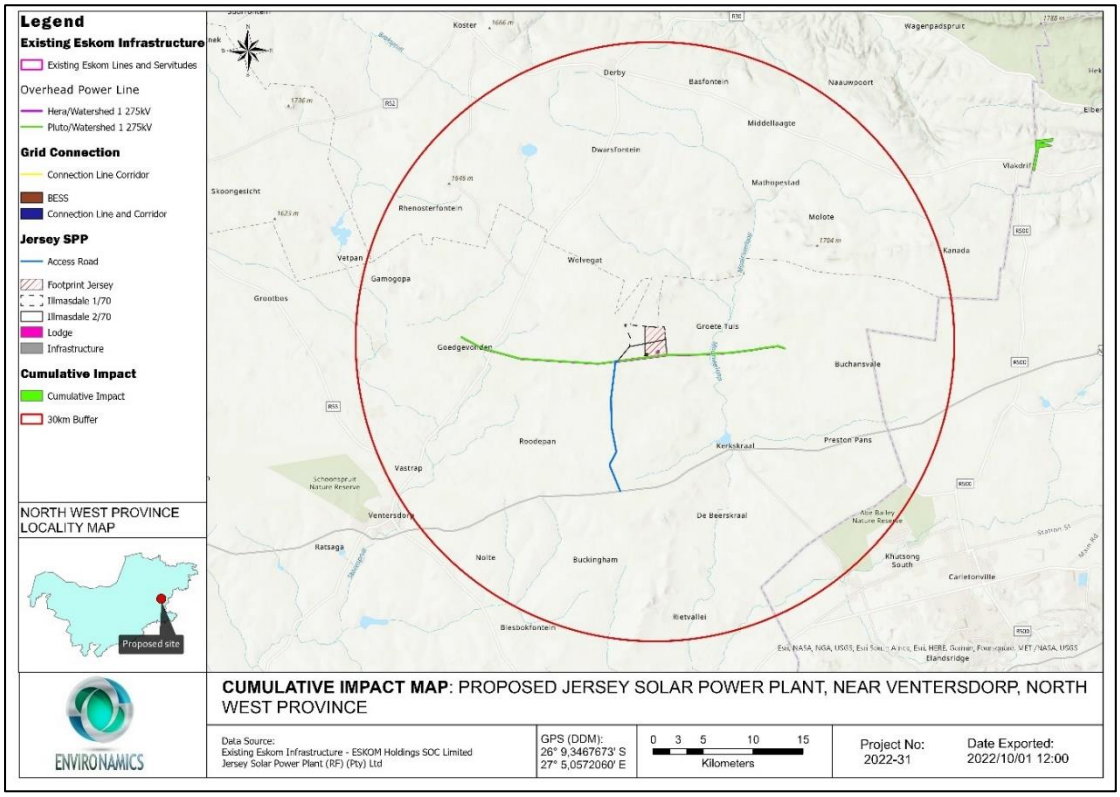


**Figure 7.1:** Geographic area of evaluation with utility-scale renewable energy generation sites and power lines

The geographic spread of PV solar projects, administrative boundaries and any environmental features (the nature of the landscape) were considered when determining the geographic area of investigation. It was argued that a radius of 30km would generally confine the potential for cumulative effects within this particular environmental landscape. The geographic area includes projects located within the North West Province. A larger geographic area may be used to analyse cumulative impacts based on the specific temporal or spatial impacts of a resource. For example, the socioeconomic cumulative analysis may include a larger area, as the construction workforce may draw from a much wider area. The geographic area of analysis is specified in the discussion of the cumulative impacts for that resource where it differs from the general area of evaluation described above.

### 7.3 Temporal Boundary of Evaluation

A temporal boundary is the timeframe during which the cumulative effects are reasonably expected to occur. The temporal parameters for these cumulative effects analysis are the anticipated lifespan of the proposed project, beginning in 2023 and extending out at least 20 years, which is the minimum expected project life of the proposed project. Where appropriate, particular focus is on near-term cumulative impacts of overlapping construction schedules for proposed projects in the area of evaluation.

## 7.4 OTHER PROJECTS IN THE AREA

### 7.4.1 Existing projects in the area

According to the DFFE's database, no solar PV plant applications have been submitted to the Department within the geographic area of investigation. It should be noted that there is uncertainty with regards to the accuracy and validity of the information obtained from the Departments database.

It is unclear whether other projects not related to renewable energy is, has been or will be constructed in this area. In general, development activity in the area is focused on agriculture. The next section of this report will aim to evaluate the potential for solar projects for this area in the foreseeable future.

As part of the SEA for Wind and Solar Energy in South Africa, the CSIR and the DFFE mapped the location of all EIA applications submitted within South Africa. According to this database no applications have been submitted for renewable energy projects within the geographical area of investigation.

## 7.5 SPECIALIST INFORMATION ON CUMULATIVE EFFECTS

In line with the Terms of Reference (ToR) provided as part of the scoping report, specialists were asked to, where possible, take into consideration the cumulative effects associated with the proposed development and other projects which are either developed or in the process of being developed in the local area – refer to Figure 7.2 for process flow. The following sections present their findings. The following sections present their findings.

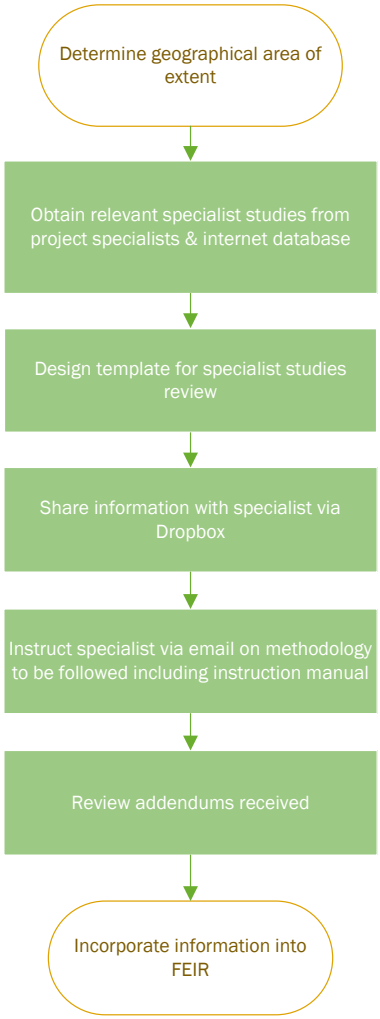


**Figure 7.2**: Process flow diagram for determining cumulative effects

### 7.5.1 Soil, Land Capability and Agricultural Potential

In quantifying the cumulative impact, the area of land taken out of grazing as a result of the above project plus this one (total generation capacity of ~700 MW) will amount to a total of approximately 1 200 hectares. This is calculated using the industry standards of 2.5 and 0.3 hectares per megawatt for solar and wind energy generation respectively, as per the Department of Fisheries, Forestry and the Environment (DFFE) Phase 1 Wind and Solar Strategic Environmental Assessment (SEA) (2015). As a proportion of the total area within a 30km radius (approximately 282,700 ha), this amounts to 0,42% of the surface area. That is considered to be within an acceptable limit in terms of loss of agricultural land that is only suitable for grazing, of which there is no scarcity in the country. This is particularly so when considered within the context of the following point:

In order for South Africa to achieve its renewable energy generation goals, agriculturally zoned land will need to be used for renewable energy generation. It is far more preferable to incur a cumulative loss of agricultural land in a region such as the one being assessed, which has very little cultivation potential, than to lose agricultural land that has a higher potential, and that is much scarcer, to

renewable energy development elsewhere in the country. The limits of acceptable agricultural land loss are far higher in this region than in regions with higher agricultural potential.

Furthermore, there are no significant other land uses, apart from renewable energy, that are competing for agricultural land in the area, and so the total cumulative loss of agricultural land from all competing land uses is not significantly higher than what has been considered above. Due to all of the considerations discussed above, the cumulative impact of loss of agricultural land use will not have an unacceptable negative impact on the agricultural production capability of the area. The proposed development is therefore acceptable in terms of cumulative impact, and it is therefore recommended that it is approved.

### 7.5.2 Ecology

The Terrestrial and Biodiversity Survey (refer to Appendix E3) states that corridors and linkages of areas with similar habitat are present in the local district where a number of solar power plants are planned. No particular habitats of threatened species that could easily be isolated (for example beetles with flightless females) are known to be impacted locally in the larger site. Overall because most of the area appears to be ideal to avoid very sensitive habitats such as larger pristine wetlands and also avoid highly sensitive habitat pockets of Threatened species, the development of a number of 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.

### 7.5.3 Avifauna

The area is not within an IBA, however it has been identified as ‘High Avian Sensitivity’ by DFFE’s screening tool. The resident avifaunal community is diverse, with moderate-low species richness and abundances. Some priority and endemic species are expected to be recorded on the site. The panels are reported to either be built with fixed inclinations or to be built with variable inclination so as to track the sun’s movement. At times, these panels will be horizontal, potentially attracting birds through the ‘lake effect’. At other times, the panels may be horizontal, and, during the day, they may create a mirror effect and result in bird collisions, or, at night, may result in collisions with migrating birds. The displacement of priority or resident avifauna through increased disturbance. Loss of avian habitat and possible collisions with PV panels leading to injury or loss of avian life are not considered as a cumulative impact due to the low number of planned solar development in a 30 km radius.

### 7.5.4 Social Impact Assessment

Jersey SPP and the establishment of other solar power projects within the area has the potential to result in significant positive cumulative impacts, specifically with regards to the creation of a number of socio-economic opportunities for the region, which in turn, can result in positive social benefits. The positive cumulative impacts include creation of employment, skills development and training

opportunities, and downstream business opportunities. The cumulative benefits to the local, regional, and national economy through employment and procurement of services are more considerable than that of Jersey SPP alone.

While the development of a single solar power project may not result in a major influx of people into an area, the development of several projects may have a cumulative impact on the in-migration and movement of people. In addition, the fact that the project is proposed within an area characterised by good levels of solar irradiation suitable for the development of commercial solar energy facilities implies that the surrounding area is likely to be subject to considerable future applications for PV energy facilities. Levels of unemployment, and the low level of earning potential may attract individuals to the area in search of better employment opportunities and higher standards of living.

It is exceedingly difficult to control an influx of people into an area, especially in a country where unemployment rates are high. It is therefore important that the project proponent implement and maintain strict adherence with a local employment policy in order to reduce the potential of such an impact occurring.

### 7.5.5 Visual

The Visual Impact Assessment (refer to Appendix E3) confirmed that the anticipated cumulative visual impact of the proposed SPP is expected to include the change in sense of place, as well as the precedent being set for SPP development in the area where currently there is only a precedent for agricultural and mining related activities. Due to the number of mines in the area, the scenic quality of the region is low, further construction and operation of the SPP in the area is likely to have a negative impact.

### 7.5.6 Heritage

The Heritage Impact Assessment (Refer to Appendix E5) concluded that the cumulative impact of the proposed Jersey Solar Power Plant is to be assessed by adding impacts from this proposed development to existing and other proposed developments with similar impacts within a 30 km radius. The existing and proposed developments that were taken into consideration for cumulative impacts include a total of 12 other plants. However, meaningful assessment of cumulative impacts requires a comprehensive review of all developments in the larger region of the site and not only those involving renewable energy.

From a review of available databases, publications, as well as available heritage impact assessments done for the purpose of developments in the region it was determined that the Jersey Solar Power project is located in an area with a very low presence of heritage sites and features.

The cultural heritage profile of the larger region is very low. Most frequently found are stone artefacts, mostly dating to the pre-colonial element consisting of very limited Stone Age and Iron Age occupation, as well as a much later colonial (farmer) component, which also gave rise to an urban and industrial (mining) component.

Heritage resources are sparsely distributed on the wider landscape with highly significant (Grade 1) sites being rare. Because of the low likelihood of finding further significant heritage resources in the area of the proposed for development and the generally low density of sites in the wider landscape the overall impacts to heritage are expected to be of generally low significance before mitigation.

For the site, the impacts to heritage sites are expected to be of medium significance. However, this can be ameliorated by implementing mitigation measures, include isolating sites, relocating sites (e.g., burials) and excavating or sampling any significant archaeological material found to occur within the site. The chances of further material being found, however, are considered to be negligible. After mitigation, the overall impact significance would therefore be low.

### 7.5.7 Paleontology

According to the Palaeontological Impact Assessment (refer to Appendix E6) the following is considered from a palaeontological perspective:

- Palaeontological impact significances inferred for renewable energy projects, where these are assessed at all, may well reflect different assessment approaches rather than contrasting palaeontological sensitivities and impact levels;
- Meaningful cumulative impact assessments require comprehensive data on all major developments within a region, not just those involving renewable energy, as well as an understanding of the extent to which recommended mitigation measures are followed through;
- Trying to assess cumulative impacts on different fossil assemblages from different stratigraphic units (for example, Precambrian stromatolites from 2.6 billion years ago versus Pleistocene alluvial deposits less than 2.5 million years old) has limited value.

The cumulative Impacts of the area will include approved electrical facilities within a 30 km radius of the project site. As the mentioned MTS and Powerlines and corridors are all underlain by similar geology the Impact on these developments will be similar. The Palaeontological Significance of this current powerline construction is rated as Low, and the cumulative Impacts will thus also be Low Negative.

### 7.5.8 Traffic

According to the Traffic Impact Assessment (refer to Appendix E8) depending on the timing of the other nearby renewable energy projects, where construction in particular could overlap, traffic impact will increase accordingly. It should be noted that the volume of traffic is related to the specific development stage, logistics planning and development size.

The construction period for other renewable energy projects is relatively short (between 12 and 18 months), where traffic flow will vary during the construction period. It is assumed that 50% of these projects' construction periods would likely coincide with the Jersey SPP construction period. This additional traffic, however, will be widely dispersed and easily accommodated on the surrounding road network. In addition, the traffic impact of the operational and maintenance periods will be low/ negligible, and it is also unlikely that the decommissioning of these projects will coincide with each

other. Along the long-distance haulage route, the maximum ADT of the major roadways are not exceeded, and the cumulative additional trips will not initiate a change in the LOS. Furthermore, the local road network (i.e., adjacent N14) is expected to continue operate well under capacity, at a LOS B.

## 7.6 IMPACT ASSESSMENT

Following the definitions of the term, the "residual effects on the environment", i.e., effects after mitigation measures have been put in place, combined with the environmental effects of past, present and future projects and activities will be considered in this assessment. Also, a "combination of different individual environmental effects of the project acting on the same environmental component" can result in cumulative effects.

### 7.6.1 Potential Cumulative Effects

The receptors (hereafter referred to as Valued Ecosystem Components (VECs) presented in Section 6 (refer to the matrix analysis) have been examined alongside other past, present and future projects for potential adverse cumulative effects. A summary of the cumulative effects discussed are summarized in Table 7.2. There have been specific VECs identified with reference to the Solar Project (Table 6.2), which relates to the biophysical and socio-economic environments. Table 7.2 indicates the potential cumulative effects VECs and the rationale for inclusion/exclusion.

**Table 7.2**: Potential Cumulative Effects for the proposed project

| | Valued Ecosystem Components (VECs) | Rationale for Inclusion / Exclusion | Level of Cumulative Effect |
|---|---|---|---|
| **Construction Phase** | | | |
| **Terrestrial Biodiversity Compliance Statement** | Habitat destruction & Fragmentation | The construction phase of the development and associated infrastructure will result in loss of and damage to natural habitats if the vegetation is cleared for the development of the solar plant. Rehabilitation of some areas would be possible but there is likely to be long-term damage in large areas. Most habitat destruction will be caused during the construction phase. | - Medium |
| | Soil erosion and sedimentation | The construction activities associated with the development may result in widespread soil disturbance and is usually associated with accelerated soil erosion. Soil erosion promotes a variety of terrestrial ecological changes associated with disturbed areas, including the establishment of alien invasive plant species, altered plant community species composition and loss of habitat for indigenous flora. The impact is considered as | - Low |

| | | | |
|---|---|---|---|
| | | cumulative as it will influence the vegetation communities in the area. | |
| | Spillages of harmful substances | Construction work for the proposed development will always carry a risk of soil and water pollution, with large construction vehicles contributing substantially due to oil and fuel spillages. If not promptly dealt with, spillages or accumulation of waste matter can contaminate the soil and surface or ground water, leading to potential medium/long-term impacts on fauna and flora. During the constructional phase heavy machinery and vehicles would be the main contributors to potential pollution problems. The impact is considered to be cumulative as the spillages of harmful substances can have indirect impacts to the surrounding environment. | - Low |
| | Spreading of alien invasive species | Continued movement of vehicles on and off the site during the construction phase will result in a risk of importation of alien species. Vehicles often transport many seeds, and some may be of invader species, which may become established along the access road, especially where the area is disturbed. The construction carries by far the greatest risk of alien invasive species being imported to the site, and the high levels of habitat disturbance also provide the greatest opportunities for such species to establish themselves, since most indigenous species are less tolerant of disturbance. The biggest risk is that seeds of noxious plants may be carried onto the site along with materials that have been stockpiled elsewhere at already invaded sites. | - Low |

| | | | |
|---|---|---|---|
| **Wetland Baseline & Risk Assessment** | Soil erosion and sedimentation | The use of heavy machinery during the construction and decommissioning phases of the development will result in the compaction of soil, resulting in decreased infiltration of rainwater and increased surface run-off volumes and velocities leading to a greater erosion risk. The hardened surfaces of the road and compacted soils of the proposed development area will also lead to an increase in surface run-off during storm events which will likely be discharged via stormwater outlet points, concentrating flows leaving the exposed areas. This can lead to erosion in the cleared areas and channel forming where culverts concentrate water on the side of the road where the river and riverine area are located. It can lead to sedimentation, in the river. The impact is considered to be cumulative due to proposed development contributing to the risk of sediment transport and erosion in the area. | - Low |
| | Soil and water pollution (Spillages of harmful substances) | Construction work will also carry a risk of soil and water pollution, with large construction vehicles contributing substantially due to oil and fuel spillages. If not promptly dealt with, spillages or accumulation of waste matter can contaminate the soil and surface- or groundwater, leading to potential medium/long-term impacts on fauna and flora.<br><br>The impact is considered to be cumulative due to proposed development contributing to the risk of soil and water pollution in the area. | - Low |
| | Spread and establishment of alien invasive species | The construction almost certainly carries by far the greatest risk of alien invasive species being imported to the site, and the high levels of habitat disturbance also provide the greatest opportunities for such species to establish themselves, since most indigenous species are less tolerant of disturbance. The biggest risk is that seeds of noxious plants may be carried onto the site along with materials that have been stockpiled elsewhere at already invaded sites.<br><br>Continued movement of personnel and vehicles on and off the site, as well as occasional delivery of materials required for maintenance, will result in a risk of importation of alien species throughout the life of the project. | - Low |

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| | | Furthermore, the spread of the alien invasive species through the area will be accelerated when seeds are carried by stormwater into the drainage features on the site that will cause environmental degradation and indigenous species to be displaced.<br><br>The wider area is already impacted by the spread of alien invasive species due to agricultural and mining activities. Therefore, the development will contribute towards the cumulative impact of spread of alien invasive species. The impact will be low as the mitigation measures proposed will reduce the overall impact of the development. | |
| **Avifauna Assessment** | Displacement of priority avian species from important habitats | The displacement of resident avifauna through increased disturbance and possible collisions with PV panels leading to injury or loss of avian life are not considered as a cumulative impact due to the low number of planned solar development in a 30 km radius. | - Low |
| | Displacement of resident avifauna | The displacement of resident avifauna through increased disturbance and possible collisions with PV panels leading to injury or loss of avian life are considered as a cumulative impact due to the large number of planned solar development in a 30 km radius. | - Low |
| | Loss of important avian habitats | The loss of important avian habitats through increased disturbance are not considered as a cumulative impact due to the low number of planned solar development in a 30 km radius. | - Low |
| **Phase 1 Cultural Heritage Assessment** | Loss or damage to sites, features or objects of cultural heritage significance | The cultural heritage profile of the larger region is very limited. Most frequently found are stone artefacts, mostly dating to the Middle Stone Age. Sites containing such material are usually located along the margins of water features (pans, drainage lines), small hills and rocky outcrops. Such surface scatters or 'background scatter' is usually viewed to be of limited significance. The colonial period manifests largely as individual farmsteads, in all its complexity, burial sites and infrastructure features such as roads, railways and power lines. For the purpose of this review, heritage sites located in urban areas have been excluded.<br><br>Because of the low likelihood of finding further significant heritage resources in the relevant area | - Low |

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| | | proposed for development and the generally low density of sites in the wider landscape the cumulative impacts to the heritage are expected to be of low significance.<br><br>The Palaeontological Sensitivity Map (http://www.sahra.org.za/sahris/map/palaeo) indicate that the project area has a very high sensitivity of fossil remains to be found and therefore a field assessment and protocol for finds is required. | |
| **Palaeontological Impact Assessment** | Disturbance, damage or destruction of legally protected fossil heritage within the development footprints during the construction phase (impacts on well-preserved and / or rare fossils of scientific and conservation value) | If a well-preserved stromatolite outcrop s is uncovered in the development footprint (after vegetation clearance) the stromatolites may be cordoned off and a buffer of 30m may be placed around the outcrop or a reprehensive example should be removed and placed near the offices of the PV as an informative example of fossils in the area., The cumulative impact of the proposed or authorised solar power plant developments is assessed as low with full mitigation. | - Low |
| **Social Impact Assessment** | Impacts of employment opportunities, business opportunities and skills development | Jersey SPP and the establishment of other solar power projects within the area has the potential to result in significant positive cumulative impacts, specifically with regards to the creation of a number of socio-economic opportunities for the region, which in turn, can result in positive social benefits. The positive cumulative impacts include creation of employment, skills development and training opportunities, and downstream business opportunities. The cumulative benefits to the local, regional, and national economy through employment and procurement of services are more considerable than that of Jersey SPP alone. | + Medium |
| | Impact with large-scale in-migration of people | While the development of a single solar power project may not result in a major influx of people into an area, the development of several projects may have a cumulative impact on the in-migration and movement of people. In addition, the fact that the project is proposed within an area characterised by good levels of solar irradiation suitable for the development of commercial solar energy facilities implies that the surrounding area is likely to be subject to considerable future applications for PV energy facilities. Levels of unemployment, and the low level of earning potential may attract individuals | - Medium |

| | | | |
|---|---|---|---|
| | | to the area in search of better employment opportunities and higher standards of living.<br><br>It is exceedingly difficult to control an influx of people into an area, especially in a country where unemployment rates are high. It is therefore important that the project proponent implement and maintain strict adherence with a local employment policy in order to reduce the potential of such an impact occurring. | |
| **Traffic Impact Study** | Increase in construction vehicles | The construction and decommissioning phases are the only significant traffic generators for renewable energy projects. The duration of these phases is short term (i.e. the impact of the generated traffic on the surrounding road network is temporary and renewable energy facilities, when operational, do not add any significant traffic to the road network).<br><br>Even if all renewable energy projects within the area are constructed at the same time, the roads authority will consider all applications for abnormal loads and work with all project companies to ensure that loads on the public roads are staggered and staged to ensure that the impact will be acceptable. | - Low |
| **Operational Phase** | | | |
| **Terrestrial Biodiversity Compliance Statement** | Habitat destruction & Fragmentation | The construction phase of the development and associated infrastructure will result in loss of and damage to natural habitats if the vegetation is cleared for the development of the solar plant. Rehabilitation of some areas would be possible but there is likely to be long-term damage in large areas. Most habitat destruction will be caused during the construction phase. | - Medium |
| | Soil erosion and sedimentation | The construction activities associated with the development may result in widespread soil disturbance and is usually associated with accelerated soil erosion. Soil erosion promotes a variety of terrestrial ecological changes associated with disturbed areas, including the establishment of alien invasive plant species, altered plant community species composition and loss of habitat for indigenous flora. The impact is considered as | - Low |

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| | | cumulative as it will influence the vegetation communities in the area. | |
| | Dust pollution | The environmental impacts of wind-borne dust, gases and particulates from the construction activities associated with the proposed development are primarily related to human health and ecosystem damage. Poor air quality results in deterioration of visibility and aesthetic landscape quality of the region, particularly in winter due to atmospheric inversions. The impact is considered to be cumulative as dust pollution has an impact on the surrounding environment and as the surrounding area is already impacted by mining and agricultural activities. | - Low |
| | Spillages of harmful substances | Construction work for the proposed development will always carry a risk of soil and water pollution, with large construction vehicles contributing substantially due to oil and fuel spillages. If not promptly dealt with, spillages or accumulation of waste matter can contaminate the soil and surface or ground water, leading to potential medium/long-term impacts on fauna and flora. During the constructional phase heavy machinery and vehicles would be the main contributors to potential pollution problems. The impact is considered to be cumulative as the spillages of harmful substances can have indirect impacts to the surrounding environment. | - Low |
| | Spreading of alien invasive species | Continued movement of vehicles on and off the site during the construction phase will result in a risk of importation of alien species. Vehicles often transport many seeds, and some may be of invader species, which may become established along the access road, especially where the area is disturbed. The construction carries by far the greatest risk of alien invasive species being imported to the site, and the high levels of habitat disturbance also provide the greatest opportunities for such species to establish themselves, since most indigenous species are less tolerant of disturbance. The biggest risk is that seeds of noxious plants may be carried onto the site along with materials that have been stockpiled elsewhere at already invaded sites. | - Low |

This chapter of the Draft Environmental Impact Report addressed the cumulative environmental effects of the construction, operation and decommissioning project phases to be further assessed as part of the EIA Phase. The information to date has shown that no significant adverse residual impacts are likely. However, cumulative impacts could arise as other similar projects are constructed in the area.

The potential most significant cumulative impacts relate to:

- Cumulative effects during construction phase:
  - Habitat destruction and fragmentation (- Medium)
  - Displacement of priority avian species from important habitats (- low)
  - Loss of important avian habitats (- low)
  - Impacts of employment opportunities, business opportunities and skills development (+ Medium)
  - Impact with large-scale in-migration of people (- Medium)
- Cumulative effects during the operational phase:
  - Habitat destruction and fragmentation (- Medium)
  - Impacts on the characteristics of the watercourse (- Medium)
  - Visual intrusion (- Medium)
- Cumulative effects during the decommissioning phase:
  - Generation of waste (- Medium)

The cumulative impact for the proposed development is medium to low and no high, unacceptable impacts related to the project are expected. Considering the extent of the project and information presented in section 7 of this report, it can be concluded that the cumulative impacts will not result in large scale changes and impacts on the environment.

Photovoltaic solar energy technology is a clean technology which contributes toward a better-quality environment. The proposed project will contribute to local economic growth by supporting industry development in line with provincial and regional goals and ensuring advanced skills are drawn to the North West Province. No cumulative impacts with a high residual risk have been identified.

In terms of the desirability of the development of sources of renewable energy therefore, it may be preferable to incur a higher cumulative loss in such a region as this one (where the landscape has already experienced degradation), than to lose land with a higher environmental value elsewhere in the country.

# 8 ENVIRONMENTAL IMPACT STATEMENT

This section aims to address the following requirements of the regulations:

**Appendix 3.** (3) An EIR (...) must include-

(l) an environmental impact statement which contains-

(i) a summary of the key findings of the environmental impact assessment:

(ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and

(iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;

(m) based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;

(p) a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;

(q) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;

## 8.1 SUMMARY OF KEY FINDINGS AND ASSESSMENT RESULTS

Based on the contents of the report the following key environmental issues were identified, which were addressed in this EIA report:

- Impacts during construction phase:
- Impacts on the fauna and flora (- Medium and- Low)
- Impacts to avifauna (- High and -Medium)
- Impacts on soil and agriculture (- Low)
- Visual impacts (-Medium and- Low)
- Impacts on wetland (-Medium and -Low)
- Social impacts (+Low and + Medium)
- Impacts on heritage resources (-Low)
- Impacts on palaeontology (- medium)
- Traffic impacts (- Low)
- Impacts during the operational phase:
- Impacts on the fauna and flora (- Medium and Low)
- Impacts to avifauna (-High and - Medium)

- Impacts associated with the soil and agriculture (- Low)
- Visual impacts (- Medium and Low)
- Social impacts (-+Low and +Medium)
- Impacts on heritage resources (- Low)

➢ Impacts during the decommissioning phase:

- Impacts on the fauna and flora (+ Medium and +Low)
- Impacts to avifauna (-Low)
- Impacts associated with the soil and agriculture (-Low)
- Impacts on heritage resources (- Low)

Cumulative biophysical impacts resulting from similar development in close proximity to the proposed activity are expected to occur, however the cumulative impact assessment included in Section 7 of this report has indicated that all cumulative impacts will be of a medium or low significance, with no impacts expected to be of a high and unacceptable significance.

## 8.2 SENSITIVITY ANALYSIS SUMMARY AND SITE-SPECIFIC CONDITIONS

The sensitivity analysis has guided the developer in optimising the final layout of the Jersey Solar Power Plant through identifying specific environmental areas and features present within the site which needs to be avoided through the careful placement of infrastructure as part of the development footprint. No environmental sensitive features have been identified on site. Refer to Section 6.4 for the complete sensitivity analysis and Figure I for the final layout map.

Further mitigation measures for the development, as recommended by the independent specialists, have been included in the EMPr(s) for the project as per Appendix F1-F4.

## 8.3 TECHNICAL DETAILS OF THE PROPOSED INFRASTRUCTURE TO BE AUTHORISED

- PV Panel Array - To produce up to 350MW, the proposed facility will require numerous linked cells placed behind a protective glass sheet to form a panel. Multiple panels will be required to form the solar PV arrays which will comprise the PV facility. The PV panels will be tilted at a northern angle in order to capture the most sun or using one-axis tracker structures to follow the sun to increase the Yield.
- Wiring to Inverters - Sections of the PV array will be wired to inverters. The inverter is a pulse width mode inverter that converts direct current (DC) electricity to alternating current (AC)electricity at grid frequency.
- Connection to the grid - Connecting the array to the electrical grid requires transformation of the voltage from 480V to 33KV to 132KV to275KV. The normal components and dimensions of a distribution rated electrical substation will be required. Output voltage from the inverter is 480V and this is fed into step up transformers to 132kV. An onsite substation will be required on the site to step the voltage up to 132kV, after which the power will be evacuated into the national grid via the proposed power line. It is expected that generation from the facility will tie in with the via the existing Eskom Hera / Watershed 275kV HV Feeder Overhead Line to the existing Eskom Pluto 400kV/275KV/22KV MTS Substation or Pluto Watershed 275kV Overhead Line. The connection options will be assessed within the same 200m wide (up to

550m wide in some instances) grid connection corridor. The Jersey SPP will inject up to 350MW into the National grid.

- Electrical reticulation network – An internal electrical reticulation network will be required and will be lain ~2-4m underground as far as practically possible.
- Supporting Infrastructure – The supporting infrastructure such as the auxiliary buildings and laydown areas will be situated in an area measuring up to 4 ha.
- Battery storage – A Battery Storage Facility with a maximum height of 8m and a maximum volume of 1,740m$^3$ of batteries and associated operational, safety and control infrastructure.
- Roads – Access will be obtained from N14 to the south of the site and via another unnamed road to the north of the site. An internal site road network will also be required to provide access to the solar field and associated infrastructure. The access and internal roads will be constructed within a 25-meter corridor.
- Fencing - For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farm. Fencing with a height of 2.5 meters will be used.

## 8.4 RECOMMENDATION OF EAP

The final recommendation by the EAP considered firstly if the legal requirements for the EIA process had been met and secondly the validity and reliability of the substance of the information contained in the EIA report. In terms of the legal requirements it is concluded that:

- The scoping phase complied with the agreement and specification set out in Regulation 21 and Appendix 2 EIA Regulations (as amended in 2017) – already approved by the environmental authority.
- All key consultees have been consulted as required by Chapter 6 of the EIA Regulations (as amended in 2017) and the public participation plant - already approved by the environmental authority.
- The EIA process has been conducted as required by the EIA Regulations (as amended in 2017), Regulations 23 and Appendix 3.
- The EMPr has been compiled in accordance with Appendix 4 of the EIA Regulations (as amended in 2017).
- The proposed mitigation measures will be sufficient to mitigate the identified impacts to an acceptable level.
- No additional specialist studies are proposed on any environmental issue raised and therefore, no terms of reference are provided for such studies.
- Option 1 of the access road alignment alternatives preferred from an environmental and technical perspective and is therefore recommended for approval as part of the EA.

In terms of the contents and substance of the EIA report the EAP is confident that:

- All key environmental issues were identified during the scoping phase. These key issues were adequately assessed during the EIA phase to provide the environmental authority with sufficient information to allow them to make an informed decision.

The final recommendation of the EAP is that:

It is the opinion of the independent EAP that the proposed development will have a net positive impact for the area and will subsequently ensure the optimal utilisation of resources. All negative environmental impacts can further be effectively mitigated through the proposed mitigation measures and avoidance of certain areas within the site as recommended by the specialists. Based on the contents of the report it is proposed that an environmental authorisation be issued, which states (amongst other general conditions) that the Jersey Solar Plant and associated infrastructure, Registration Division IP, North West Province be approved subject to the following conditions:

- Implementation of the proposed mitigation measures set out in the EMPrs (Appendix I1-I4).
- Implementation of the proposed mitigation measures set out in the specialist studies.
- The proposed solar facility must comply with all relevant national environmental laws and regulations.
- All actions and tasks allocated in the EMPr should not be neglected and a copy of the EMPr should be made available onsite at all times.
- Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.
- The required biodiversity walk-throughs must be undertaken prior to construction.
- The period for which the Environmental Authorisation is required is between 7 and 10 years. This is based on the fact that the project is proposed to be bid as part of the DMRE REIPPP Programme, with there being uncertainty regarding the announcement of the next bidding rounds, and the need for a valid Environmental Authorisation.

We trust that the department find the report in order and await your final decision in this regard.

Ms Lisa Opperman

Environamics Environmental Consultants

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