QUANTUM 1 SOLAR ENERGY FACILITY (SEF) WITHIN MOGALE LOCAL MUNICIPALITY IN THE WEST RAND DISTRICT MUNICIPALITY, GAUTENG PROVINCE

REVISED BASIC ASSESSMENT REPORT

OCTOBER 2023

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PROJECT DETAILS

Title	:	Basic Assessment Report for the Proposed Quantum 1 Solar Energy Facility (SEF) within Mogale Local Municipality in the West Rand District Municipality, Gauteng Province
Authors	:	Savannah Environmental (Pty) Ltd Jo-Anne Thomas Chantelle Geyer Michael Morreira Cornelius Holtzhausen
Client	:	South Africa Mainstream Renewable Power Developments (Pty) Ltd
Report Revision	:	Revised Basic Assessment Report for Public and authority review and comment
Date	:	October 2023

When used as a reference this report should be cited as: Savannah Environmental (2023). Revised Basic Assessment Report for the Quantum 1 Solar Energy Facility (SEF) within Mogale Local Municipality in the West Rand District Municipality, Gauteng Province.

PURPOSE OF THE BASIC ASSESSMENT REPORT AND INVITATION TO COMMENT

South Africa Mainstream Renewable Power Developments (Pty) Ltd is proposing the construction and operation of a solar photovoltaic (PV) facility and associated infrastructure on Portion 285 (a portion of portion 19) of the Farm Vlakplaats 160, located approximately 7.2km west of Krugersdorp, within the Mogale City Local Municipality in the West Rand District Municipality in the Gauteng Province. The facility will have a contracted capacity of up to 10MW and will be known as Quantum 1 Solar Energy Facility (SEF).

The Applicant appointed Savannah Environmental as the independent environmental consultant to undertake the Basic Assessment (EIA) for the proposed project. The BA process is being undertaken in accordance with the requirements of the 2014 EIA Regulations, as amended, promulgated in terms of the National Environmental Management Act (NEMA; Act No. 107 of 1998).

A Basic Assessment Report was prepared by Savannah Environmental and made available for a 30-day public review period from 30 August 2023 – 02 October 2023. Based on the comments provided in the letter received 30 September 2023 from the GDARD, the listed activities within the Basic Assessment Report have been updated,

The correction of the listed activities will result in the inclusion of additional information that was not applicable to this report consulted on during the initial public participation process. Therefore, in terms of Regulation 19(1)(b), the revised report will be subjected to another public participation process of 30 days, from 10 October to 10 November 2023.

Please submit your comments by **10 November 2023** to:
Cornelius Holtzhauen of **Savannah Environmental** PO Box 148, Sunninghill, 2157 Tel: 011-656-3237 Mobile: 060 978 8396 Fax: 086-684-0547 Email: publicprocess@savannahsa.com

Comments can be made as written submission via fax, post or email.

EXECUTIVE SUMMARY

South Africa Mainstream Renewable Power Developments (Pty) Ltd is proposing the construction and operation of a solar photovoltaic (PV) facility and associated infrastructure on Portion 285 (a portion of portion 19) of the Farm Vlakplaats 160, located approximately 7.2km west of Krugersdorp, within the Mogale City Local Municipality in the West Rand District Municipality in the Gauteng Province. The facility will have a contracted capacity of up to 10MW and will be known as Quantum 1 Solar Energy Facility (SEF). Electricity generated and will be evacuated from an onsite substation via 11kV Monopole or lattice structure pylons to the Eskom Tarlton 132/44/11kV substation located on the same land parcel as the proposed PV facility. A corridor 100m wide and 0.1- 0.12km long is being assessed through a separate EA process to finalise the routing.

As the project has the potential to impact on the environment, a Basic Assessment (BA) Reporting process is required to be completed in support of an application for Environmental Authorisation prior to the commencement of construction of the project.

A preferred project site has been identified by the developer as follows:

- Project Site/Area: The Project Site/Area is the area with an extent of approx. ~94.1479ha, within which the development footprint will be located.
- Development area: The Development Area is that identified area (located within the Project Site) of ~94.1479ha demarcated within the Affected properties for consideration in the EIA process where the and associated infrastructure is planned to be located.
- Development footprint: The development footprint is the defined area (located within the development area) where the PV array and other associated infrastructure for the PV Facility and associated infrastructure is planned to be constructed. This is the actual footprint of the facility, and the area which would be disturbed and is ~19.99ha.

The Integrated Resource Plan (IRP) 2019 developed by the Department of Energy indicates that South Africa continues to pursue a diversified energy mix that reduces reliance on a single or a few primary energy sources. Renewable energy, including Solar PV, wind and CSP with storage present an opportunity to diversify the energy mix, and to produce grid connected or distributed off-grid electricity. In order to achieve this diversified mix and harness the benefits of renewable energy, the IRP 2019 includes an allocation of 6000MW of new capacity to large scale PV by 2030.

From a regional perspective, the area within the West Rand District Municipality identified for the project is considered favourable for the development of a commercial PV facility due to the low environmental sensitivity of the identified site, excellent solar resource, and availability of land on which the development can take place. There is also potential for evacuating the power to the national grid via a direct grid connection at the Eskom Tarlton 132/44/11kV substation which is adjacent to the proposed site. The site is also in proximity to large electricity users which opens opportunities for commercial PPAs (Behind the meter connection Or Wheeling to a 3rd party off-taker.

It is in this context that the Quantum 1 SEF project is being proposed. Ultimately, the project is intended to be a part of the renewable energy projects portfolio for South Africa, as contemplated in the Integrated Resource Plan, and Integrated Energy Plan.

The Quantum 1 SEF is proposed to accommodate the following infrastructure, which will enable the PV facility to supply a contracted capacity of up to 10MW:

- Solar PV array comprising solar modules.
- Mounting System Technology
- Inverters and transformers.
- Low voltage cabling between the PV modules to the inverters.
- Overhead power lines
- Onsite substation, switching substation and laydown areas.
- Battery Energy Storage System (BESS) and associated infrastructure.
- Internal access roads.
- Fence around the project development areas.
- Occupation & Maintenance (O&M) buildings

The table below provides an overview of the Quantum 1 SEF.

Overview of the Quantum 1 SEF development area

Province	**Gauteng Province**
District Municipality	West Rand District Municipality
Local Municipality	Mogale City Local Municipality
Ward Number (s)	Ward 30
Nearest town(s)	Krugersdorp (7.2km east)
Farm name(s) and number(s) of properties affected by the PV Facility, incl SG 21 Digit Code (s)	Portion 265 (a portion of portion 19) of the Farm Vlakplaats 160 (T0IQ00000000016000265)
Current zoning	Agriculture
Site Coordinates (centre of development area)	26° 4'8.17"S, 27°38'55.89"E
Total extent of the Affected Properties, also referred to as the project site[1]	~94.1479ha

Detailed specialist studies were conducted based on results of the DFFE Sensitivity Screening report. No environmental fatal flaws or unacceptable impacts were identified through the respective studies provided that recommended mitigation measures are implemented. The potential environmental impacts associated with Quantum 1 SEF assessed by respective specialists through the BAR process include:

- Impacts on terrestrial ecology (flora and fauna)
- Impacts on freshwater ecology.
- Impacts on avifauna.
- Impacts on soils and agricultural potential.
- Impacts on heritage resources, including archaeology, palaeontology and the cultural landscape.
- Visual impacts on the area imposed by the components of the facility.
- Positive and negative social impacts.
- Traffic impacts on the area

[1] The project site is that identified area within which the development area and development footprint are located. The project site is ~94.1479ha in extent and only consist of one affected property.

Impact Statement

The preferred activity was determined by the developer to be the development of a renewable energy facility on site using solar PV as the preferred technology, due to the availability of a strong solar resource, available grid connection, benign topography and good site access, amongst others. A technically viable development footprint was proposed by the developer considering environmental sensitivities identified and assessed as part of the BA process. The assessment of the development footprint within the project site was undertaken by independent specialists and their findings have informed the results of this BA Report.

From a review of the relevant policy and planning framework, it was concluded that the project is well aligned with the policy framework, and a clear need for the project is seen from a policy perspective at a local, provincial and National level.

The specialist findings from the BA process have indicated that there are no identified fatal flaws associated with the implementation of the development footprint within the project site subject to implementation of the recommended mitigation measures. Specialist studies have concluded that the proposed layout for the PV facility and associated infrastructure, as proposed is acceptable within the development area, and can be authorised on condition that the recommended mitigation measures are implemented.

Impacts can be mitigated to acceptable levels or enhanced through the implementation of the recommended mitigation or enhancement measures. The layout assessed within this BA Report is therefore considered to be acceptable for implementation and should be authorised.

The benefits of Quantum 1 SEF are expected to occur at a national, regional and local level. As the costs to the environment at a site-specific level can be appropriately managed and minimised as detailed in this report, the benefits of the project are expected to partially offset the localised environmental costs of the solar facility.

From a social perspective, both positive and negative impacts are expected. The implementation of the 'do-nothing' alternative will result in a number of lost opportunities. The 'do nothing' alternative is therefore not preferred and not proposed to be implemented for the development of Quantum 1 SEF.

Through the assessment of the development footprint within the project site, it can be concluded that the development of Quantum 1 SEF will not result in unacceptable environmental impacts (subject to the implementation of the recommended mitigation measures).

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GAUTENG PROVINCE
AGRICULTURE AND RURAL DEVELOPMENT
REPUBLIC OF SOUTH AFRICA

Basic Assessment Report in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014 (Version 1/2022)

Kindly note that:

1. This **Basic Assessment Report** is the standard report required by GDARD in terms of the EIA Regulations, 2014.

2. This template is current as of April 2022. It is the responsibility of the EAP to ascertain whether subsequent versions of the template have been published or produced by the competent authority.

3. A draft Basic Assessment Report must be submitted, for purposes of comments within a period of thirty (30) days, to all State Departments administering a law relating to a matter likely to be affected by the activity to be undertaken.

4. **A draft Basic Assessment Report must be submitted, for purposes of comments within a period of thirty (30) days, to a Competent Authority (uploaded to the EIA online system) empowered in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended to consider and decide on the application. The EIA online system can be accessed at https://eia.gauteng.gov.za.**

5. **A copy (PDF) of the final report and attachments must be uploaded to the EIA online system. The EIA online system can be accessed at https://eia.gauteng.gov.za.**

6. **Draft and final reports submitted in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) must be emailed to environmentsue@gauteng.gov.za.**

7. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.

8. Selected boxes must be indicated by a cross and, when the form is completed electronically, must also be highlighted.

9. An incomplete report may lead to an application for environmental authorisation or Waste Management License being refused.

10. Any report that does not contain a titled and dated full colour large scale layout plan of the proposed activities including a coherent legend, overlain with the sensitivities found on site may lead to an application for environmental authorization or Waste Management License being refused.

11. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the application for environmental authorisation or Waste Management License being refused.

12. The applicant must fill in all relevant sections of this form. Incomplete applications will not be processed. The applicant will be notified of the missing information in the acknowledgement letter that will be sent within 10 days of receipt of the application.

13. Unless protected by law, and clearly indicated as such, all information filled in on this application will become public information on receipt by the competent authority. The applicant/EAP must provide any interested and affected party with the information contained in this application on request, during any stage of the application process.

14. Although pre-application meeting with the Competent Authority is optional, applicants are advised to have these meetings prior to submission of application to seek guidance from the Competent Authority.

DEPARTMENTAL DETAILS

Gauteng Department of Agriculture and Rural Development
Attention: Administrative Unit of the Sustainable Utilisation of the Environment (SUE) Branch
P.O. Box 8769
Johannesburg
2000

Ground floor, Umnotho House, 56 Eloff Street, Johannesburg

Administrative Unit telephone number: (011) 240 3051/3052
Department central telephone number: (011) 240 2500

(For official use only)

NEAS Reference Number:						
File Reference Number:						
Application Number:						
Date Received:						

If this BAR has not been submitted within 90 days of receipt of the application by the competent authority and permission was not requested to submit within 140 days, please indicate the reasons for not submitting within time frame.

Not applicable

Is a closure plan applicable for this application and has it been included in this report? No

if not, state reasons for not including the closure plan.

The application is not for a mining application. There is no closure phase for the project.

Has a draft report for this application been submitted to a competent authority and all State Departments administering a law relating to a matter likely to be affected as a result of this activity? Yes

Is a list of the State Departments referred to above attached to this report including their full contact details and contact person? Yes

If no, state reasons for not attaching the list.

Have State Departments including the competent authority commented? No

If no, why?

The draft report has only been made available to Interested and Affected Parties (I&APs), Stakeholders and relevant Organs of State from 30 August 2023. ~~No comments have been received prior to the report release.~~ In terms of Regulation 19(1)(b), a revised BA report will be subjected to another public participation process of 30 days, from 10 October to 10 November 2023. All comments received during the public review period will be included in the Basic Assessment Report to be submitted to the Department in the form of a Comments and Response Report.

SECTION A: ACTIVITY INFORMATION

1. PROPOSAL OR DEVELOPMENT DESCRIPTION

Project title (must be the same name as per application form):

Quantum 1 Solar Energy Facility (SEF) within Mogale Local Municipality in the West Rand District Municipality, Gauteng Province.

Project Description:

South Africa Mainstream Renewable Power Developments (Pty) Ltd is proposing the construction and operation of a solar photovoltaic (PV) facility and associated infrastructure on Portion 285 (a portion of portion 19) of the Farm Vlakplaats 160, located approximately 7.2km west of Krugersdorp, within the Mogale City Local Municipality in the West Rand District Municipality in the Gauteng Province (refer to **Figure 1**).

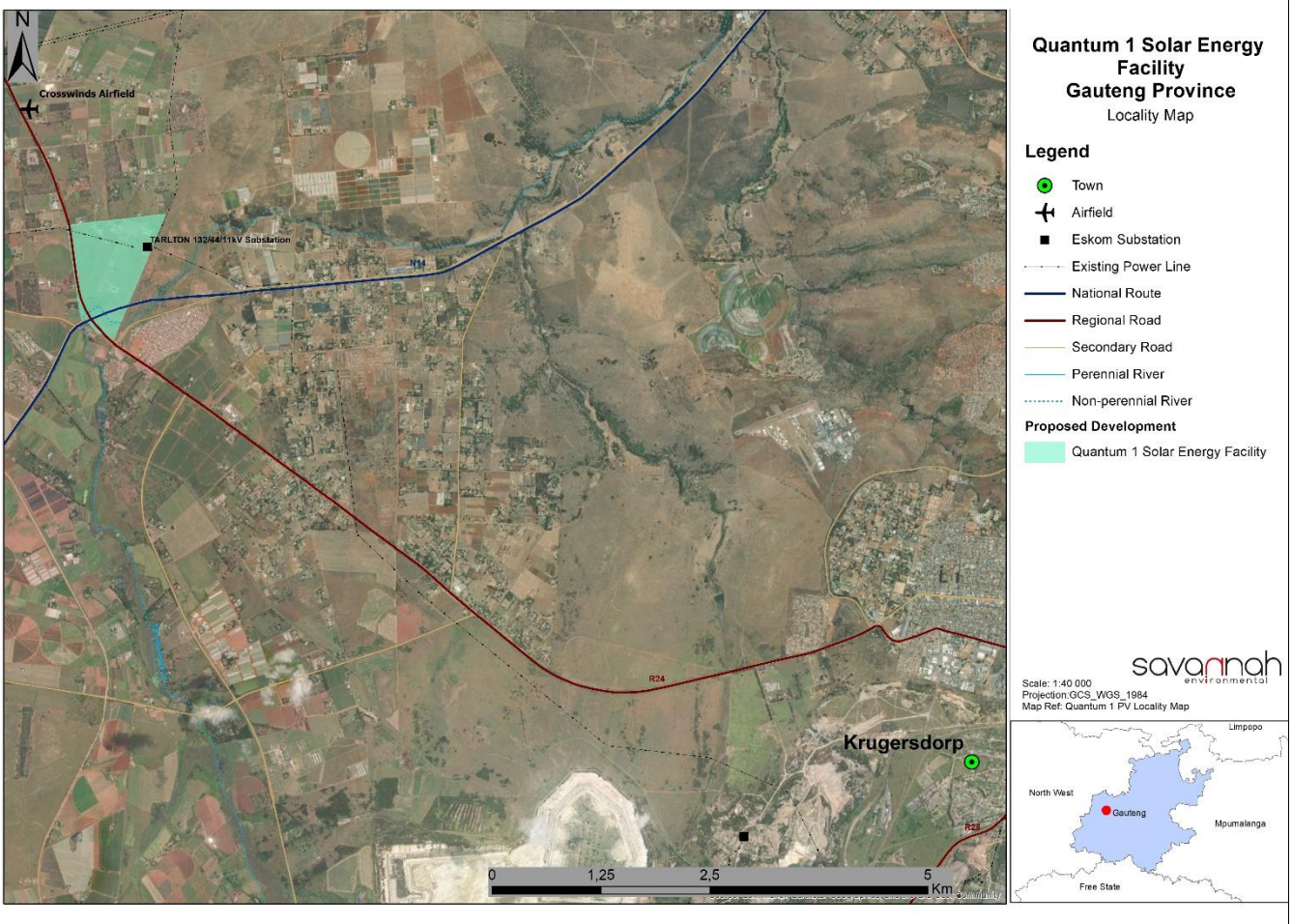

Figure 1: Locality map of the project site showing the location of the site in relation to the closest towns of the area (refer to **Appendix A**)

The facility will have a contracted capacity of up to 10MW and will be known as Quantum 1 Solar Energy Facility (SEF). Electricity generated will be evacuated from an onsite substation via 11Kv Monopole or lattice structure pylons to the Eskom Tarlton 132/44/11Kv substation located on the same land parcel as the proposed PV facility. The grid connection will be assessed through a separate EIA process.

OVERVIEW OF THE PROJECT

The Quantum 1 SEF is proposed in response to the identified objectives of the national and provincial government and local and district municipalities to develop renewable energy facilities for power generation purposes. It is the developer's intention to submit a bid in terms of a regulated power purchase procurement process (e.g., REIPPPP) with the aim of evacuating the generated power into the national grid or obtaining a commercial PPA (Power Purchase Agreement). This will aid in the diversification and stabilisation of the country's electricity supply, in line with the objectives of the Integrated Resource Plan (IRP) with the Quantum 1 SEF set to inject up to 10MW into the national grid.

From a regional perspective, the area within the West Rand District Municipality identified for the project is considered favourable for the development of a commercial PV facility due to the low environmental sensitivity of the identified site, excellent solar resource, and availability of land on which the development can take place. There is also potential for evacuating the power to the national grid via a direct grid connection at the Eskom Tarlton 132/44/11Kv substation which is adjacent to the proposed site. The site is also in proximity to large electricity users which opens opportunities for commercial PPAs (Behind the meter connection Or Wheeling to a 3rd party off-taker).

Project Site/Area: The Project Site/Area is the area with an extent of 2etland. 94.1479ha, within which the Quantum 1 Solar PV Facility development footprint will be located.

Development area: The Development Area is that identified area (located within the Project Site) of ~94.1479ha demarcated within the Affected properties for consideration in the EIA process where the Quantum 1 Solar PV Facility and associated infrastructure is planned to be located.

Development footprint: The development footprint is the defined area (located within the development area) where the PV array and other associated infrastructure for the Quantum 1 Solar PV Facility and associated infrastructure is planned to be constructed. This is the actual footprint of the facility, and the area which would be disturbed and is 19.99ha.

The layout and project capacity will be confirmed as the BA process proceeds and environmental constraints are identified. Details of the Quantum 1 solar energy facility are included in the table below

Component	Description / Dimensions
District Municipality	West Rand District Municipality
Local Municipality	Mogale City Local Municipality
Ward Number (s)	Ward 30
Nearest town(s)	Krugersdorp (7.2km east)
Farm name(s) and number(s) of properties affected by the PV Facility, incl SG 21 Digit Code(s)	Portion 265 (a portion of portion 19) of the Farm Vlakplaats 160 (T0IQ00000000016000265)
Current zoning	Agriculture
Site Coordinates (centre of development area)	26° 4'8.17"S, 27°38'55.89"E
Total extent of the Affected Properties, also referred to as the project site	~94.1479ha
Total extent of the Development area	~94.1479ha
Total extent of the Development footprint	19.99ha

Contracted capacity of the PV facility	10MW
PV panels	Height: up to 5m from ground level (installed)
Power line capacity	11Kv
Power line servitude width	Up to 18m
Grid connection	To be evacuated from the onsite substation via 11Kv Monopole or lattice structure pylons to the Eskom Tarlton 132/44/11Kv substation located on the same land parcel as the proposed PV facility. This will form part of a separate EA process.
On-site Facility Substation, and O&M buildings	» Located within the development area. » Approximately 1.5ha in extent.
Battery Energy Storage System (BESS)	» The BESS area will form part of the 1.5ha allocated for other infrastructure.
Access roads and internal roads	» Existing roads will be used as far as possible. There are existing gravel roads that can be utilised for site access (width of up to 6m). Upgrading of existing roads or new roads may be required.

OVERVIEW OF POWER GENERATION TECHNOLOGIES PROPOSED

SOLAR PV TECHNOLOGY

Solar energy facilities use energy from the sun to generate electricity through a process known as the **Photovoltaic Effect**. This effect refers to photons of light colliding with electrons, and therefore placing the electrons into a higher state of energy to create electricity. The solar fields of the PV facilities will comprise the following components:

Photovoltaic Cells:
A photovoltaic (PV) cell is made of silicone that acts as a semiconductor used to produce the photovoltaic effect. PV cells are arranged in multiples/arrays and placed behind a protective glass sheet to form a PV panel. Each PV cell is positively charged on one side and negatively charged on the opposite side, with electrical conductors attached to either side to form a circuit. This circuit captures the released electrons in the form of an electric current (i.e., Direct Current (DC)).

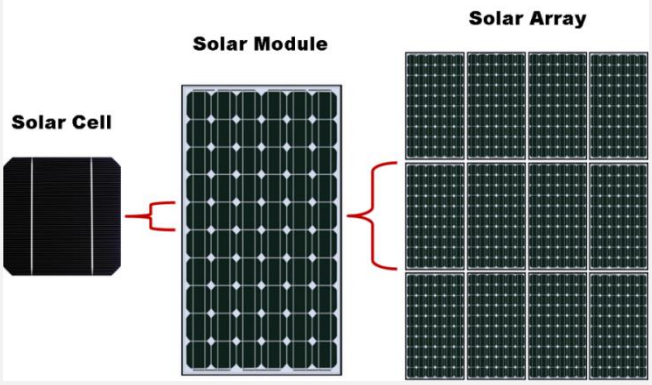

Figure 2: Overview of a PV cell, module and array/panel (Source: pveducation.com).

A solar PV module is made up of individual solar PV cells connected together, whereas a solar PV array is a system made up of a group of individual solar PV modules electrically wired together to form a much larger PV installation. The PV panels will be fixed to support structures to maximise exposure to the sun.

Inverters

Inverters are used to convert the electricity produced by the PV cells from Direct Current (DC) into Alternating Current (AC) to enable the facility to be connected to the national electricity grid. Numerous inverters will be arranged in several arrays to collect and convert power produced by the facilities.

The length of the construction period for the PV facility is estimated to be approximately 12 months. PV panels are designed to operate continuously for more than 20-25 years, mostly unattended and with low maintenance.

Support Structures

PV panels will be fixed to support structures. PV panels can either utilise fixed / static support structures, or alternatively they can utilise single or double axis tracking support structures. PV panels which utilise fixed / static support structures are set at an angle (fixed-tilt PV system) so as to optimise the amount of solar irradiation received. With fixed / static support structures the angle of the PV panel is dependent on the latitude of the proposed development and may be adjusted to optimise for summer and winter solar radiation characteristics. PV panels which utilise tracking support structures track the movement of the sun throughout the day so as to receive the maximum amount of solar irradiation.

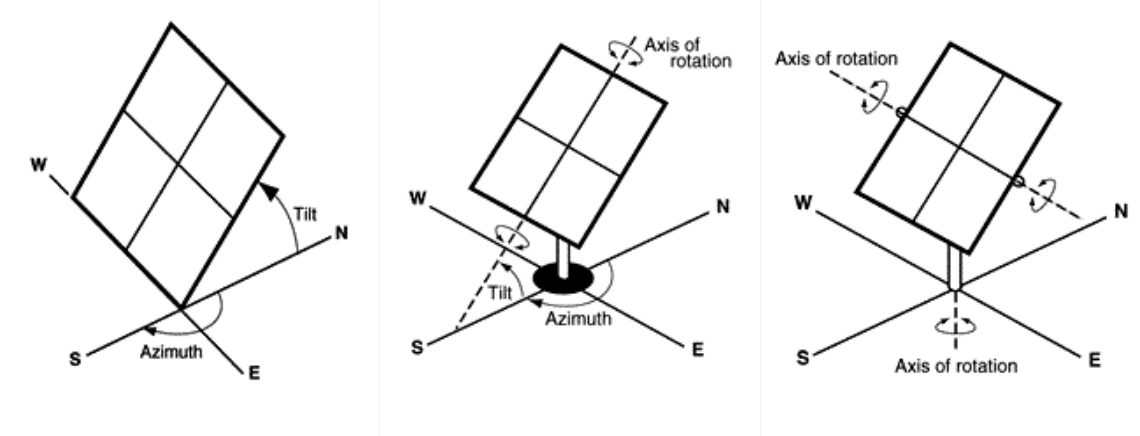

Figure 3: Overview of different PV tracking systems (from left to right: fixed-tilt, single-axis tracking, and double-axis tracking (Source: pveducation.com).

BATTERY ENERGY STORAGE SYSTEM (BESS)

The need for a Battery Energy Storage Facility stems from the fact that electricity is only produced by the solar field while the sun is shining, while the peak demand may not necessarily occur during the day-time. Therefore, the storage of electricity and supply thereof during peak-demand will mean that the facility is more efficient, reliable and electricity supply more constant.

The BESS will:

» Store and integrate a greater amount of renewable energy from the Quantum 1 PV Facility into the electricity grid.
» Assist with the objective to generate electricity by means of renewable energy to feed into the National Grid.
» Proposed footprint of battery storage area will fall within the footprint reserved for the substation and associated infrastructure
» Proposed capacity of battery storage: 10MW, 60MWh

» Proposed technology to be used: Solid State Batteries or Redox Flow Batteries.

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

In accordance with the EIA Regulations, 2014 (as amended) published in terms of Section 24(5) of the National Environmental Management Act (No. 107 of 1998) (NEMA), the applicant requires Environmental Authorisation (EA) from the Gauteng Department of Agriculture and Rural Development (GDARD) for the development of the proposed project. In terms of Section 24(5) of NEMA, the EIA Regulations 2014 (as amended) and Listing Notices (GNR 327, GNR 325, and GNR 324), the application for EA for the solar PV facility is subject to the completion of Basic Assessment process. The application is required to be supported by comprehensive, independent environmental studies undertaken in accordance with the EIA Regulations, 2014 (as amended).

A Basic Assessment (BA) Process is required to be undertaken in support of an Application for Authorisation if any activities from the EIA Regulations, 2014 (as amended) in terms of Listing Notice 1 (GM:327 and Listing Notice 3 (GN: 324) of the NEMA are triggered. The BA process is designed to assess smaller scale activities, the impacts of which are generally known and can be easily managed. However, it still requires public notification and participation, consideration of the potential environmental impacts of the activity, assessment of possible mitigation measures, and an assessment of whether there are any significant issues or impacts that might require further investigation.

Savannah Environmental has been appointed as the independent environmental consultant responsible for managing the application for EA and undertaking the supporting BA process required to identify and assess potential environmental impacts associated with the project detailed above, as well as propose appropriate mitigation and management measures to be contained within the Environmental Management Programme (EMPr).

Table 1 details the listed activities in terms of the EIA Regulations, 2014 (as amended) that apply to the project, and for which an application for Environmental Authorisation has been submitted to GDARD. The table also includes a description of the specific project activities that relate to the applicable listed activities.

Table 1: Listed activities as per the EIA Regulations that are triggered by the Quantum PV Energy Facility

Notice Number	Activity Number	Description of listed activity
Listing Notice 1 (GNR 327) 08 December 2014 (as amended on 07 April 2017)	1(i)	The development of facilities or infrastructure for the generation of electricity from a renewable resource where— **2.** the electricity output is more than 10 megawatts but less than 20 megawatts; or ***The project comprises a renewable energy generation facility, which will utilise solar power technology and will have a contracted capacity of up to 10MW.***
~~Listing Notice 1 (GNR 327) 08 December 2014 (as amended on 07 April 2017)~~	~~14~~	~~The development and related operation of facilities and infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.~~

		~~***The development of the project will require the construction and operation of facilities and infrastructure for the storage and handling of a dangerous good (combustible and flammable liquids, such as oils, lubricants, solvents) associated with the on-site substation where such storage will occur inside containers with a combined capacity exceeding 80 cubic meters but not exceeding 500 cubic meters.***~~ ***Listing Notice 1 (GNR 327) 08 December 2014 (as amended on 07 April 2017) Activity 14 is not triggered by this Application.*** ***The development of the project will require the construction and operation of facilities and infrastructure for the storage and handling of a dangerous good (combustible and flammable liquids, such as oils, lubricants, solvents) associated with the on-site substation where such storage will occur inside containers with a combined capacity* of up to 50 cubic meters only.**
Listing Notice 1 (GNR 327) 08 December 2014 (as amended on 07 April 2017)	24(ii)	The development of a road— (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 meters. ***Existing roads will be used where possible, gravel access roads with a general width of 6m, and required length, to be confirmed at final design.***
Listing Notice 1 (GNR 327) 08 December 2014 (as amended on 07 April 2017)	27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation. ***The PV array and other associated infrastructure for the SEF will occupy a footprint with an area of 19.99ha. The development will result in the clearing of indigenous vegetation more than 1 hectare but less than 20 hectares of indigenous vegetation***
Listing Notice 1 (GNR 327) 08 December 2014 (as amended)	28 (ii)	*Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:* *(ii) will occur outside an urban area, where the total land to be developed is bigger than 1ha.* ***The total area to be developed for the proposed renewable energy facility is greater than 1ha and occurs outside an urban area in an area currently zoned for agriculture.***
Listing Notice 3 (GNR 324) 08 December 2014 (as amended on 07 April 2023)	4€(vi)	The development of a road wider than 4 metres with a reserve of less than 13.5 metres. c. Gauteng vi. Important Bird and Biodiversity Areas (IBA). **The development of the Quantum 1 SEF will require the construction of internal access roads up to 6m wide. The proposed Quantum 1 SEF Development Area is located within the Magaliesberg Important Bird Area (IBA) SA025. Ref: Figure 4 below**
Listing Notice 3 (GNR 324)	10(c)(xii)	The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good where such storage occurs in containers with a

08 December 2014 (as amended on 07 April 2023)		combined capacity of 30 but not exceeding 80 cubic metres. c. Gauteng xii. Important Bird and Biodiversity Areas (IBA). **The development of the project will require the construction and operation of facilities and infrastructure for the storage and handling of a dangerous good (combustible and flammable liquids, such as oils, lubricants, solvents) associated with the on-site substation where such storage will occur inside containers with a combined capacity exceeding 50 cubic meters. The proposed Quantum 1 SEF Development Area is located within the Magaliesberg Important Bird Area (IBA) SA025. Ref: Figure 4 below**
~~Listing Notice 3 (GNR 324) 08 December 2014 (as amended)~~	~~4(c)(iv)(vi)(vii)~~	~~The development of a road wider than 4 metres with a reserve of less than 13.5 metres.~~ ~~-~~ ~~c. Gauteng~~ ~~iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;~~ ~~vi. Important Bird and Biodiversity Areas (IBA)~~ ~~vii. Sites identified as high potential agricultural land in terms of Gauteng Agricultural Potential Atlas.~~ ***~~The development of the Quantum 1 SEF will require the construction of internal access roads up to 6m wide.~~*** ***~~The site is listed as an Ecological Support Area (ESA) and a Critical Biodiversity Area 1 (CBA) as per the Gauteng Conservation Plan.~~*** ***~~The proposed Quantum 1 SEF Development Area is located within the Magaliesberg Important Bird Area (IBA) SA025~~*** ***~~A portion of the project development area is identified as high potential agricultural land in terms of Gauteng Agricultural Potential Atlas (Zone 15).~~***
~~Listing Notice 3 (GNR 324) 08 December 2014 (as amended)~~	~~10(c)(ii)(iv)(vii)(xii)~~	~~The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.~~ ~~c. Gauteng~~ ~~ii. National Protected Area Expansion Strategy Focus Areas;~~ ~~iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;~~ ~~vii. Sites identified as high potential agricultural land in terms of Gauteng Agricultural Potential Atlas.~~ ~~xii. Important Bird and Biodiversity Areas (IBA)~~ ***~~The development of the project will require the construction and operation of facilities and infrastructure for the storage and handling of a dangerous good (combustible and flammable liquids, such as oils, lubricants, solvents) associated with the on-~~***

		~~site substation where such storage will occur inside containers with a combined capacity exceeding 30 cubic meters.~~ ***~~The southern section of the development area is located within one of the National Protected Area Expansion Strategy Focus Areas (NPAES). This section is labelled as a priority focus area.~~*** ***~~The site is listed as an Ecological Support Area (ESA) and a Critical Biodiversity Area 1 (CBA) as per the Gauteng Conservation Plan.~~*** ***~~A portion of the project development area is identified as high potential agricultural land in terms of Gauteng Agricultural Potential Atlas (Zone 15).~~*** ***~~The proposed Quantum 1 SEF Development Area is located within the Magaliesberg Important Bird Area (IBA) SA025~~***
~~Listing Notice 3 (GNR 324) 08 December 2014 (as amended)~~	~~12(c)(ii)~~	~~The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.~~ ~~c. Gauteng~~ ~~ii. Within Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans; or~~ ***~~An area in excess of 300m² of indigenous vegetation would be required to be cleared.~~*** ***~~The site is listed as an Ecological Support Area (ESA) and a Critical Biodiversity Area 1 (CBA) as per the Gauteng Conservation Plan.~~***

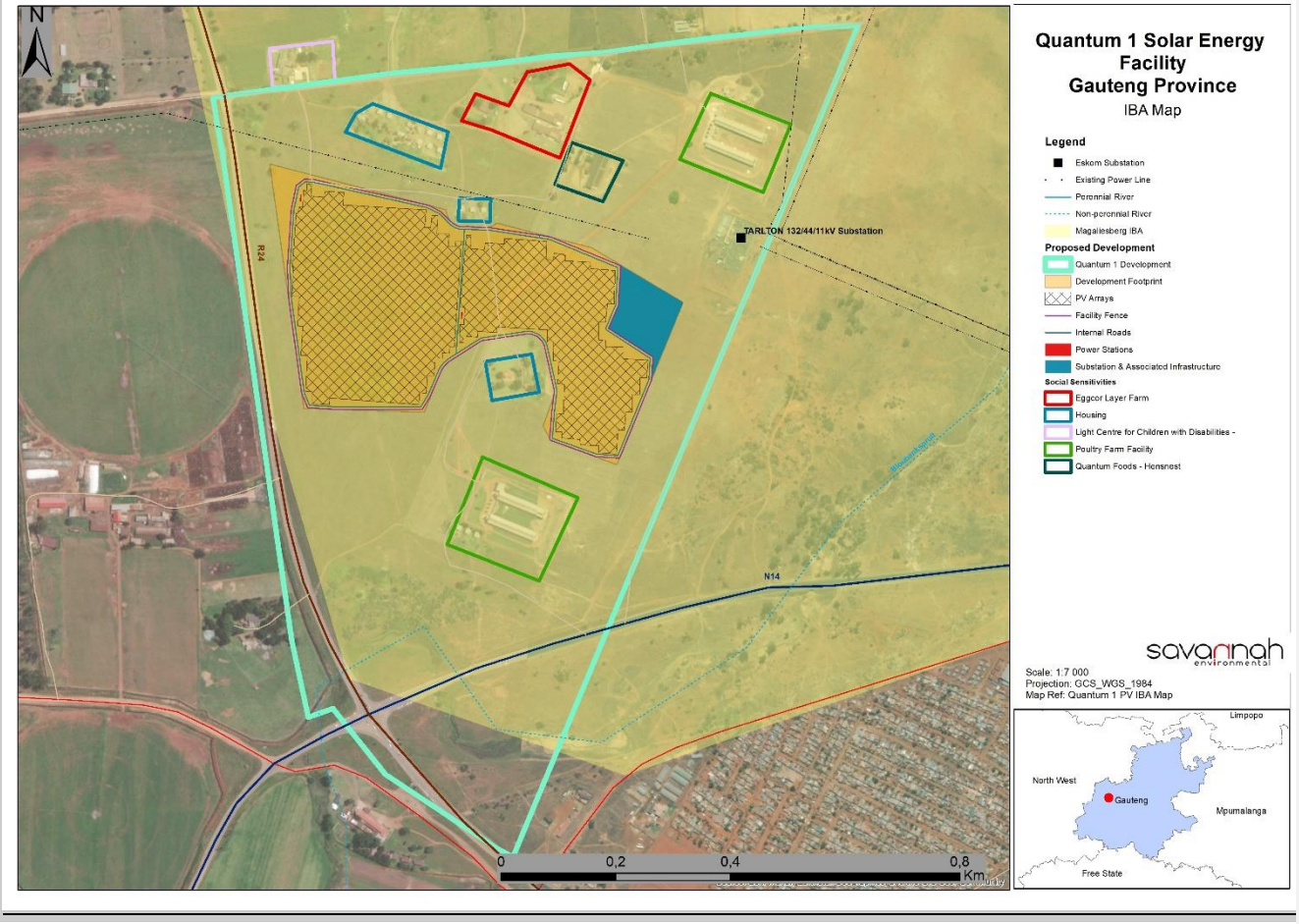

Figure 4: The proposed development area relative to Important Bird Area (IBA)

Select the appropriate box

The application is for an upgrade of an existing development		The application is for a new development	X	Other, specify	

Does the activity also require any authorisation other than NEMA EIA authorisation?

YES	

If yes, describe the legislation and the Competent Authority administering such legislation

National Environmental Management: Biodiversity Act 10 of 2004- Gauteng Department of Agriculture and Rural Development (GDARD):

Regulations that encourage the sustainable use of natural and indigenous resources and provides for the management and conservation of South Africa's biodiversity through the protection of species, natural environments and ecosystems, while promoting the sustainable use of indigenous biological resources.

National Water Act, 36 of 1998 – Department of Water and Sanitation (DWS):

Regulations concerning the conservation and use of water. Treatment and disposal of waste, wastewater and effluent. Pollution and pollution emergencies.

If yes, have you applied for the authorisation(s)?	NO
If yes, have you received approval(s)? (attach in appropriate appendix)	NO

2. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations:

Title of legislation, policy or guideline:	Administering authority:	Promulgation Date:
National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended).	National & Provincial	27 November 1998
Constitution of the Republic of South Africa (Act 106 of 1998)	National & Provincial	18 December 1996
National Water Act 36 of 1998	National & Provincial	26 August 1998
National Heritage Resources Act 25 of 1999	National & Provincial	28 April 1999
National Environmental Management: Biodiversity Act 10 of 2004	National & Provincial	07 June2004
Occupational Health and Safety Act 85 of 1993	National & Provincial	23 June 1993
2014 EIA Regulations (as amended)	National & Provincial	08 December 2014
Protection of Personal Information Act, 2013	National	26 November 2013
Gauteng Conservation-Plan Version 3.3	Provincial	October 2011
Gauteng Spatial Development Plan 2030	Provincial	August 2022
West Rand District Municipality Spatial Development Framework (SDF) (2014-2017)	District	
West Rand District Municipality Integrated Development Plan (2022-2023)	District	
Mogale City Local Municipality Integrated Development Plan (IDP) (2022-2023)	Local	

Description of compliance with the relevant legislation, policy or guideline:

Legislation, policy of guideline	Description of compliance
National Environmental Management Act (No. 107 of 1998) (NEMA)	The national environmental management principles state that the social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment. The project is currently being assessed in accordance with the requirements of the 2014 EIA Regulations, as amended, published in terms of Section 24(5) of NEMA. Through this assessment, all potential social and environmental risks are identified and assessed, and appropriate mitigation measures proposed.
Constitution of the Republic of South Africa (Act 106 of 1998)	Section 24 of the Constitution pertains specifically to the environment. It states that everyone has the right to an environment that is not harmful to their health or well-being, and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological

Legislation, policy of guideline	Description of compliance
	degradation, promote conservation and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. The Constitution outlines the need to promote social and economic development. Section 24 of the Constitution therefore requires that development be conducted in such a manner that it does not infringe on an individual's environmental rights, health, or well-being. This is especially significant for previously disadvantaged individuals who are most at risk to environmental impacts. The undertaking of an BA process for the proposed project in terms of the requirements of the EIA Regulations, 2014 (as amended), aims to minimise any impacts on the natural and social environment.
National Water Act 36 of 1998	A water use listed under Section 21 of the NWA must be licensed with the Regional DWS, unless it is listed in Schedule 1 of the NWA (i.e. is an existing lawful use), is permissible under a GA, or if a responsible authority waives the need for a licence. Water use is defined broadly, and includes consumptive and non-consumptive water uses, taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation. Consumptive water uses may include taking water from a water resource (Section 21(a)) and storing water (Section 21(b)). Non-consumptive water uses may include impeding or diverting of flow in a water course (Section 21(c)), and altering of bed, banks or characteristics of a watercourse (Section 21(i)). The development footprint is within the 500m regulation zone and buffer zone of water resources, which makes the application of the Risk Assessment Matrix (RAM) relevant to the proposed development. Because activities that take place further afield than the extent of the buffer zones can often lead to impacts to the wetland unit, the RAM is inclusive of the risks that these activities may impose. The applicant intends to source the water from an existing borehole on site. A water use authorisation will be required in terms of Section 21 (a)(c)&(i) of the National Water Act 36 of 1998.
National Heritage Resources Act 25 of 1999	Section 07 of the NHRA stipulates assessment criteria and categories of heritage resources according to their significance. Section 35 of the NHRA provides for the protection of all archaeological and palaeontological sites, and meteorites.

Legislation, policy of guideline	Description of compliance
	Section 36 of the NHRA provides for the conservation and care of cemeteries and graves by SAHRA where this is not the responsibility of any other authority. Section 38 of the NHRA lists activities which require developers or any person who intends to undertake a listed activity to notify the responsible heritage resources authority and furnish it with details regarding the location, nature, and extent of the proposed development. Section 44 of the NHRA requires the compilation of a Conservation Management Plan as well as a permit from SAHRA for the presentation of archaeological sites as part of tourism attraction. A Heritage Impact Assessment has been undertaken for the project as per the requirements Section 38 of the NHRA. No significant heritage resources have been identified within the development footprint. -A 250m no development buffer should be implemented along the N14. The layout provided complies with this requirement. Should a heritage resource be impacted upon, a permit may be required from SAHRA or The Gauteng provincial authority in accordance with of Section 48 of the NHRA, and the SAHRA Permit Regulations (GN R668).
National Environmental Management: Biodiversity Act 10 of 2004	Section 53 of NEM:BA provides for the MEC / Minister to identify any process or activity in such a listed ecosystem as a threatening process. Three government notices have been published in terms of Section 56(1) of NEM:BA as follows: » Commencement of TOPS Regulations, 2007 (GNR 150). » Lists of critically endangered, vulnerable and protected species (GNR 151). » TOPS Regulations (GNR 152). It provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), and vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (NEM:BA: National list of ecosystems that are threatened and in need of protection, (Government Gazette 37596, GNR 324), 29 April 2014). Chapter 5 of NEM:BA pertains to alien and invasive species, and states that a person may not carry out a restricted activity involving a specimen of an alien species without a permit issued in terms of Chapter 7 of NEM:BA, and that a permit may

Legislation, policy of guideline	Description of compliance
	only be issued after a prescribed assessment of risks and potential impacts on biodiversity is carried out. Applicable, and exempted alien and invasive species are contained within the Alien and Invasive Species List (GNR 864). Two floral SCC were noted to be relevant to the project area from the Screening Tool Assessment, namely Dicliptera magaliesbergensis (Acanthaceae) and Melolobium subspicatum (Fabaceae). Both species are listed as Vulnerable. A biodiversity impact assessment was undertaken for the project. Neither of these species were noted during the field survey. It is also highly unlikely that either of these species would occur within the survey property due to the relatively transformed status of the habitat. No NEM:BA listed species were recorded within the development footprint. Alien plant species, namely Kikuyu (*Pennisetum clandestinum*), and annual weeds such as *Tagetes minuta*, *Verbena brasiliensis, Conyza canadensis, Conyza bonariensis, Bide13etlanosa*, and *Schkuhria bipinnata* were recorded on the site. The pioneering grass species, namely *Cynodon dactylon*, is also common within the area, which is indicative of disturbances. 13etlandland and riparian zones of the watercourse are particularly prone to alien vegetation encroachment, with the upper riparian zones being almost entirely dominated by exotic species. *Acacia baileyana, Acacia dealbata, Acacia decurrens, Ligustrum lucidum, Solanum mauritianum, Cereus jamacaru, Opuntia ficus-indica*, and a multitude of annual weeds being dominance within the area. The wetland zones associated with the watercourses are also largely dominated by *Pennisetum clandestinum* (Kikuyu).
Gauteng Conservation-Plan Version 3.3	The Gauteng C-Plan classified areas within the province on the basis of its contribution to reach the conservation targets within the province. These areas are classified as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) to ensure sustainability in the long term. The development area includes a CBA1 zone that dominates the outer eastern boundary zone of the development area.
Gauteng Spatial development Framework (GSDF)	All metropolitan, regional and local SDFs for Gauteng province jointly seek to achieve the integration of economically disadvantaged communities into the urban system, particularly those on the periphery of the system. Within Gauteng each municipality is required to prepare a SDF which must outline the spatial development within their respective jurisdictions. The GSDF is used as a tool for forward planning to direct decisions with regard to land development throughout the province. The desired outcomes of the GSDF, through infrastructural investment and the management of activity patterns, are:

Legislation, policy of guideline	Description of compliance
	» Integration of the apartheid fragmented municipalities in the province and the municipalities in the wider Gauteng City Region. » Safe, affordable and sustainable public transport, in contrast with private mobility, on which the present provincial structure is focused. » Quality of life and living through proximity to, or easy and affordable access to quality open space and social and cultural facilities » Shared, sustainable and inclusive economic growth, ensuring that everyone in the province can get access to economic opportunities and contribute to, and share in the economic development of the province. » Protection and enhancement of the natural environment, ensuring the sustainability of natural systems and the fauna and flora habitats within these and their connectivity and bio-diversity. » Choice, enabling individuals and communities to decide within an overarching framework what works for them, where opportunity presents itself and where to locate in the urban system without incurring inordinate premiums and » Creativity and innovation, ensuring that the province can adapt to change in constructive ways. The GSDP notes that the province's need for energy is increasing but still relies heavily on coal to generate energy. Alternative, renewable, and suitable energy sources need to be developed. The GSDP 2030 also notes as one of its key policy objectives, the development and protection of natural resources. This would be accomplished through curbing emissions through developing more sustainable electricity supply and making industrial, commercial and mining operations and buildings more energy efficient.
West Rand District Municipality Final Integrated Development Pl–n - Framework for 2021 – 2022.	The integrated planning approach for the WRDM is documented in the IDP which focuses on bulk service delivery as well as major and future developments in the region and the associated potential to alleviate poverty and enhance economic growth. The IDP ensures that processes at the district and local municipal levels are aligned and to provide a framework for prioritising and sequencing local municipalities' programmes and development priorities for the next five years. To diversify economic activities in all the Gauteng regions, the Transformation, Modernisation and Reindustrialisation (TMR) strategy identifies sectors to promote economic development in each of the province's municipalities. The WRDM has a Five Year Plan that is aligned to the National Development Plan (NDP) (the overarching policy document for

Legislation, policy of guideline	Description of compliance
	the country as a whole which targets creating 11 million jobs by 2030) and the TMR, the outcomes of which are: » Basic service delivery improvement. » Accountable municipal administration. » Skilled, capacitated, competent and motivated workforce. » Ethical administration and good governance. » Safe communities. » Educated communities. » Healthy communities. » Sustainable environment. » Build spatially integrated communities. » Socially cohesive communities. » Reduced unemployment. » Economic development. » Robust financial administration and Institutional planning and transformation. Finally, as part of the vision of the WRSDF, the strategy includes the creation of new independent power producers to generate renewable, affordable, and reliable energy to power new industries and create competitive advantages.
Mogale City Local Municipality (MCLM) Integrated Development Plan Review for 2022 – 2023.	The city has developed a Climate Change Strategy and Operational Framework to reduce vulnerability and built resilience (adaptation) against the negative impacts of climate change. The strategy further aims to set-out the path to which the MCLM could put measures to minimize the climate change impacts, reduce greenhouse gas emissions footprint and improve its resilience through adaptation and mitigation means. The Strategy was further intended to raise climate change awareness and establish interdepartmental linkage in response to the MCLM's overarching climate change impacts. Thus, mainstreaming of the MCLM's Climate Change Response Plans will improve and inform cross-cutting sector planning and management as well as the flow of information on possible risks (floods, hail) affecting service delivery. A number of projects are currently underway that give effect to the strategy, which includes among others, the promotion of water conservation mechanisms, implementation of energy efficiency projects, support to projects that promote food security, and mainstreaming of climate change at planning level especially on land use management issues.

3. ALTERNATIVES

Describe the proposal and alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be

accomplished. The determination of whether the site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment.

The no-go option must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. **Do not** include the no go option into the alternative table below.

Note: After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Please describe the process followed to reach (decide on) the list of alternatives below

In accordance with the requirements of Appendix 3 of the 2014 EIA Regulations (GNR 326), an EIA process must contain a consideration of alternatives, which can include site (i.e. development footprint), activity, technology and site access alternatives, as well as the "do-nothing" alternative. Alternatives are required to be assessed in terms of social, biophysical, economic and technical factors.

The DFFE Guideline for determining alternatives states that the key criteria for consideration when identifying alternatives are that they should be "practicable", "feasible", "relevant", "reasonable" and "viable". Essentially there are two types of alternatives:

» Fundamentally (totally) different alternatives to the project.
» Incrementally different (modifications) alternatives to the project.

i. Consideration of Fundamentally Different Alternatives

Fundamentally different alternatives are usually assessed at a strategic level, and as a result project-specific EIAs are therefore limited in scope and ability to address fundamentally different alternatives. At a strategic level, electricity generating alternatives have been addressed as part of the DMRE's current Integrated Resource Plan for Electricity 2010 – 2030 (IRP), 2019, and will continue to be addressed as part of future revisions thereto. In this regard, the need for renewable energy power generation (including solar and wind) has been identified as part of the technology mix for power generation in the country in the next 20 years. Of particular relevance to the proposed project is the allocation of 6000MW of new capacity to large scale PV included in the IRP 2019 for the period up to 2030. The site is considered most suitable for the development of a PV solar energy facility as a result of local irradiation, and the locality of the site relative to existing grid connection infrastructure. Therefore, fundamentally different alternatives to the proposed project are not considered within this BA process.

ii. Consideration of Incrementally Different Alternatives

Incrementally different alternatives relate specifically to the project under investigation. "Alternatives", in relation to a proposed activity, means different ways of meeting the general purposes and requirements of the activity, which may include alternatives to:

» The property on which, or location where the activity is proposed to be undertaken.
» The type of activity to be undertaken.

- The design or layout of the activity.
- The technology to be used in the activity.
- The operational aspects of the activity.

The applicable alternatives are discussed under the respective sub-headings below. Where no alternatives are applicable, a motivation has been included.

a) Site Alternatives

Based on the site-specific attributes, the proponent considers the project site as highly preferred for the development of a solar PV facility from a technical perspective. As a result, no location/property alternatives are proposed as part of this BA process. The following technical points support the proposed development:

- **Prevailing climatic conditions:** The economic viability of a solar PV facility is directly dependent on the annual direct solar irradiation values of the area within which it will operate. The Global Horizontal Irradiation (GHI) for the study area approximately 1972kWh/m2/annum, and an annual direct normal irradiation of approximately 2191 kWh/ m² /year, these significantly high solar irradiation potential values are favourable for the development of solar energy projects and the successful operation thereof. The high solar resource value ensures the best value for money is gained for the economy of South Africa.
- **Site extent:** The affected property (i.e. Portion 285 (a portion of portion 19) of the Farm Vlakplaats 160), known as the project site, is approximately ~94.1479ha, the full extent of which will be assessed, to determine a development footprint of ~19.99ha, which will be sufficient for the installation of a facility with a contracted capacity of up to 10MW and allowing for avoidance of environmental site sensitivities.
- **Topography:** The development area has a relatively flat topography which is suitable for the development of the Quantum 1 SEF. The topography in the study area is flat, gently sloping from about 1560 masl to1582 masl in a southerly direction. The topography of the project site is critical as it informs the nature and level of foundations required for mounting structures of the PV panel modules and other associated infrastructure. It also has an impact on the total output energy generated from the facility. Although the nature of the of topography will be investigated further, based on initial assessments the project site is considered feasible for the placement of the proposed Quantum 1 project.
- **Site access:** Access to the project site is considered as an important criteria as appropriate access is required for the transportation of project related infrastructure and heavy machinery during construction. The proximity of the project site to viable access routes decreases the traffic impact on secondary roads during the construction and operation phases of the project. The project site can be accessed via an existing farm road, east off the R24, approximately 1km north of the N14, north of the town of Tarlton. Existing roads will be used where possible, gravel access roads with a general width of 12m, and required length, to be confirmed at final design. Existing access to the site is reliable and runs directly to the development area, the location of the Quantum 1 SEF and its associated infrastructure is considered to be suitable and appropriate from a technical perspective.
- **Grid access**: Grid connection suitability is a key criterion when considering the suitability of a renewable energy facility. Long connection lines have increased environmental impacts and increased costs for project developments. Electricity generated and will be evacuated from an onsite substation via 11kV monopole or lattice structure pylons to the Eskom Tarlton 132/44/11kV

substation located on the same land parcel as the proposed PV facility. A corridor 100m wide and 0.1- 0.12km long is being applied for through a NEMA Grid Query process to finalise the routing. The need for an extensive grid network upgrade or long power line is therefore mitigated.

» **Landowner support:** The selection of a site where the landowner is supportive of the development of a renewable energy facility is essential for ensuring the success of the project. The affected property, Portion 285 (a portion of portion 19) of the Farm Vlakplaats 160, is privately owned. The landowner is in favour of the development and does not view the establishment of the solar PV facility as a conflict with the current land use practices (i.e. agriculture).

Based on the above, the proponent considers the development area and project site as highly preferred in terms of the development of a solar PV facility. As a result, no property/location alternatives are proposed as part of this BA process.

b) Technology Alternatives

PV Technology Alternatives

Few technology options are available for solar facilities, and the use of those that are considered are usually differentiated by weather and temperature conditions that prevail in the area, so that optimality is obtained by the final site selection. Solar energy is considered to be the most suitable renewable energy technology for this area, based on the site location, ambient conditions and energy resource availability.

Solar PV was determined as the most suitable option for further assessment. The Integrated Resource Plan (IRP) 2019 excludes the procurement of power from CSP facilities until 2030; whereas new additional capacity of approximately 6 000MW will be required from solar PV facilities. Therefore, PV technology was identified as being the preferred option for the study area. Solar PV consists of a lower visual profile and limited water requirements when compared to the CSP technology option. Therefore, considering the above, no other technology alternatives are being assessed for development on the proposed site.

When considering PV as a technology choice, several types of panels are available, including *inter alia*:

» Bifacial PV panels
» Monofacial PV panels
» Fixed mounted PV systems (static / fixed-tilt panels).
» Single-axis tracking or double-axis tracking systems (with solar panels that rotate around a defined axis to follow the sun's movement).

The primary difference between PV technologies available relate to the extent of the facility, as well as the height of the facility (visual impacts), however the potential for environmental impacts remains similar in magnitude. Fixed mounted PV systems are able to occupy a smaller extent and have a lower height when compared to tracking PV systems, which require both a larger extent of land, and are taller in height. However, both options are considered to be acceptable for implementation from an environmental perspective.

Battery Energy Storage System Alternatives

The general purpose and utilisation of a Battery Energy Storage System (BESS) is to save and store excess electrical output as it is generated, allowing for a timed release when the capacity is required. BESS

systems therefore provide flexibility in the efficient operation of the electric grid through decoupling of the energy supply and demand. A Battery storage facility may be constructed as part of the project, if it is deemed economically feasible to do so, for the solar facility. Two BESS technology alternatives are available: Solid State Batteries or Redox Flow Batteries. Both options will be fully containerised and delivered to site already assembled. Both options are considered to be acceptable for implementation from an environmental perspective.

c) Layout Alternatives

The Quantum 1 SEF will have a development footprint of approximately 19.99ha, to be located within the development area of approximately 94.1479ha. Based on the environmental screening study and the landowner requirements, the Quantum 1 SEF development area was identified by the developer as being technically feasible and viable. Specialist field surveys and assessments were undertaken as part of the BA process in order to provide the proponent with site specific information regarding the study area and the development area considered for the PV development (refer to **Appendix G**).

The consideration of the suitability of the site for the proposed project is in line with a typical mitigation hierarchy:

1. **Avoidance** of adverse impacts as far as possible by use of preventative measures (in this instance a sensitivity analysis assisted in the avoidance of identified sensitive areas).
2. **Minimisation** or reduction of adverse impacts to 'as low as practicable' (in this instance minimisation of impact on identified sensitive areas through implementing mitigation).
3. **Remedy or compensation** for adverse residual impacts, which are unavoidable and cannot be reduced further.

No feasible design or layout alternatives were identified for the proposed project.

Provide a description of the alternatives considered

No.	**Alternative type**, either alternative: site on property, properties, activity, design, technology, energy, operational or other (provide details of "other")	**Description**
1.	**Proposal:** Preferred Site, Technology and Layout	**Preferred Site:** The Preferred Site is Portion 285 (a portion of portion 19) of the Farm Vlakplaats 160, located approximately 7.2km west of Krugersdorp, within the Mogale City Local Municipality in the West Rand District Municipality in the Gauteng Province. **Preferred Technology:** Renewable power generation using solar PV technology. The PV facility will utilise the following: » Bifacial PV panels; or » Monofacial PV panels. » Fixed mounted PV systems (static / fixed-tilt panels); or

No.	**Alternative type**, either alternative: site on property, properties, activity, design, technology, energy, operational or other (provide details of "other")	**Description**
		» Single-axis tracking or double-axis tracking systems (with solar panels that rotate around a defined axis to follow the sun's movement). Battery Energy Storage System: Solid State Batteries or Redox Flow Batteries. **Preferred Layout:** Layout which avoids identified sensitivities as presented in Appendix A.

In the event that no alternative(s) has/have been provided, a motivation must be included in the table below.

3. PHYSICAL SIZE OF THE ACTIVITY

Indicate the total physical size (footprint) of the proposal as well as alternatives. Footprints are to include all new infrastructure (roads, services etc), impermeable surfaces and landscaped areas:

	Size of the activity:
Proposed activity ***(Total environmental (landscaping, parking, etc.) and the building footprint)***	19.99ha
Alternatives:	
Alternative 1 (if any)	[redacted]
Alternative 2 (if any)	
	Ha/ m²

or, for linear activities:

	Length of the activity:
Proposed activity	[redacted]
Alternatives:	
Alternative 1 (if any)	[redacted]
Alternative 2 (if any)	
	m/km

Indicate the size of the site(s) or servitudes (within which the above footprints will occur):

	Size of the site/servitude:
Proposed activity	94.1479ha
Alternatives:	
Alternative 1 (if any)	[redacted]
Alternative 2 (if any)	

4. SITE ACCESS

Proposal

Does ready access to the site exist, or is access directly from an existing road?	YES [redacted]

If NO, what is the distance over which a new access road will be built m

Describe the type of access road planned:

The project site can be accessed via an existing farm road, east off the R24, approximately 1km north of the N14, north of the town of Tarlton. Existing access to the site is reliable and runs directly to the development area, the location of the Quantum 1 SEF and its associated infrastructure is considered to be suitable and appropriate from a technical perspective.

Include the position of the access road on the site plan (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

Alternative 1

Does ready access to the site exist, or is access directly from an existing road?

If NO, what is the distance over which a new access road will be built m

Describe the type of access road planned:

Include the position of the access road on the site plan. (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

Alternative 2

Does ready access to the site exist, or is access directly from an existing road?

If NO, what is the distance over which a new access road will be built m

Describe the type of access road planned:

Include the position of the access road on the site plan. (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

PLEASE NOTE: Points 6 to 8 of Section A must be duplicated where relevant for alternatives

Section A 6-8 has been duplicated **0** Number of times

(only complete when applicable)

6. LAYOUT OR ROUTE PLAN

A detailed site or route (for linear activities) plan(s) must be prepared for each alternative site or alternative activity. It must be attached to this document. The site or route plans must indicate the following:

- the layout plan is printed in colour and is overlaid with a sensitivity map (if applicable);
- layout plan is of acceptable paper size and scale, e.g.
  - A4 size for activities with development footprint of 10sqm to 5 hectares;
  - A3 size for activities with development footprint of > 5 hectares to 20 hectares;
  - A2 size for activities with development footprint of >20 hectares to 50 hectares);
  - A1 size for activities with development footprint of >50 hectares);

- The following should serve as a guide for scale issues on the layout plan:
  - A0 = 1: 500
  - A1 = 1: 1000
  - A2 = 1: 2000

- A3 = 1: 4000
- A4 = 1: 8000 (±10 000)

- shapefiles of the activity must be included in the electronic submission on the CDs;
- the property boundaries and Surveyor General numbers of all the properties within 50m of the site;
- the exact position of each element of the activity as well as any other structures on the site;
- the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, sewage pipelines, septic tanks, storm water infrastructure;
- servitudes indicating the purpose of the servitude;
- sensitive environmental elements on and within 100m of the site or sites (including the relevant buffers as prescribed by the competent authority) including (but not limited thereto):
  - Rivers and wetlands;
  - the 1:100 and 1:50 year flood line;
  - ridges;
  - cultural and historical features;
  - areas with indigenous vegetation (even if it is degraded or infested with alien species);
- Where a watercourse is located on the site at least one cross section of the water course must be included (to allow the position of the relevant buffer from the bank to be clearly indicated)

Refer to **Appendix A** for a map depicting the preferred layout as well as a map showing the layout in relation to identified environmental sensitivities.

FOR LOCALITY MAP (NOTE THIS IS ALSO INCLUDED IN THE APPLICATION FORM REQUIREMENTS)

- the scale of locality map must be at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map;
- the locality map and all other maps must be in colour;
- locality map must show property boundaries and numbers within 100m of the site, and for poultry and/or piggery, locality map must show properties within 500m and prevailing or predominant wind direction;
- for gentle slopes the 1m contour intervals must be indicated on the map and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the map;
- areas with indigenous vegetation (even if it is degraded or infested with alien species);
- locality map must show exact position of development site or sites;
- locality map showing and identifying (if possible) public and access roads; and
- the current land use as well as the land use zoning of each of the properties adjoining the site or sites.

Refer to **Appendix A** for a locality map.

7. SITE PHOTOGRAPHS

Colour photographs from the center of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under the appropriate Appendix**.** It should be supplemented with additional photographs of relevant features on the site, where applicable.

Refer to **Appendix B** for site photos.

8. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of 1:200 for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity to be attached in the appropriate Appendix.

Refer to **Appendix C** for facility illustration.

SECTION B: DESCRIPTION OF RECEIVING ENVIRONMENT

Note: Complete Section B for the proposal and alternative(s) (if necessary)

Instructions for completion of Section B for linear activities

1) For linear activities (pipelines etc.) it may be necessary to complete Section B for each section of the site that has a significantly different environment.
2) Indicate on a plan(s) the different environments identified
3) Complete Section B for each of the above areas identified
4) Attach to this form in a chronological order
5) Each copy of Section B must clearly indicate the corresponding sections of the route at the top of the next page.

Section B has been duplicated for sections of the route	**0**	times

Instructions for completion of Section B for location/route alternatives

1) For each location/route alternative identified the entire Section B needs to be completed
2) Each alterative location/route needs to be clearly indicated at the top of the next page
3) Attach the above documents in a chronological order

Section B has been duplicated for location/route alternatives		times	(complete only when appropriate)

Instructions for completion of Section B when both location/route alternatives and linear activities are applicable for the application

Section B is to be completed and attachments order in the following way

- All significantly different environments identified for Alternative 1 is to be completed and attached in a chronological order; then
- All significantly different environments identified for Alternative 2 is to be completed and attached chronological order, etc.

Section–B - Section of Route [redacted] (complete only when appropriate for above)

5. PROPERTY DESCRIPTION

Property description: (Including Physical Address and Farm name, portion etc.)	Portion 285 (a portion of portion 19) of the Farm Vlakplaats 160

2. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in decimal degrees. The degrees should have at least six

decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

Alternative: Preferred Layout	**Latitude (S):**	**Longitu€(E):**
'26° "'8.17"S, '27°38"55.89"E		

In the case of linear activities:

Alternative:	**Latitude (S):**	**Long€de (E):**
☐ Starting point of the activity	°	°
☐ Middle point of the activity	°	°
☐ End point of the activity	°	°

For route alternatives that are longer than 500m, please provide co-ordinates taken every 250 meters along the route and attached in the appropriate Appendix

Addendum of route alternatives attached

The 21 digit Surveyor General code of each cadastral land parcel

PROPOSAL	**T**	**0**	**I**	**Q**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**6**	**0**	**0**	**0**	**2**	**6**	**5**
ALT. 1																					
ALT. 2																					

6. GRADIENT OF THE SITE

Indicate the general gradient of the site.

7. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site.

8. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY

9. a) Is the site located on any of the following?

Shallow water table (less than 1.5m deep)		NO
Dolomite, sinkhole or doline areas	YES	
Seasonally wet soils (often close to water bodies)		NO
Unstable rocky slopes or steep slopes with loose soil		NO
Dispersive soils (soils that dissolve in water)		NO
Soils with high clay content (clay fraction more than 40%)		NO
Any other unstable soil or geological feature		NO
An area sensitive to erosion		NO

(Information in respect of the above will often be available at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by Geological Survey may also be used).

According to the Surface Water Ecosystems Ecological, Delineation and Impact Surveys conducted during June 2023 (included in **Appendix G**), the proposed development site is underlain by dolomite, which is a geological feature known to be particularly associated with groundwater of good quantity and quality. Development features that pose a potential threat to groundwater quality are generally not supported by authorities. A PV solar facility is not regarded as a development type that would pose a threat to groundwater quality and quantity. The Paleontological field assessment revealed no rocky outcrops, including dolomites of any kind.

b) are any caves located on the site(s) NO

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S): **L€itude (E):**

[redacted]

c) are any caves located within a 300m radius of the site(s) NO

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S)€ongitude (E):

[redacted]

d) are any sinkholes located within a 300m radius of the site(s) NO

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude €: **Longitude (E):**

[redacted]

If any of the answers to the above are "YES" or "unsure", specialist input may be requested by the Department

6. AGRICULTURE

Does the site have high potential agriculture as contemplated in the Gauteng Agricultural Potential Atlas (GAPA 4)?	[redacted]	NO

Please note: The Department may request specialist input/studies in respect of the above.

Please note: According to the Soil and Agricultural Potential Assessment attached as **Appendix G**, following field work, the project site has been found to have low sensitivities associated with land potential resources, it is the specialist's opinion that the proposed activities will have an acceptable impact on soil resources and that the proposed activities may proceed as have been planned as no loss of land capability is evident. It is also expected that no segregation of high production agricultural resources will occur.

7. GROUNDCOVER

To be noted that the location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Indicate the types of groundcover present on the site and include the estimated percentage found on –ite

Natural veld - good condition **% = 10**	Natural veld with scattered aliens **% = 15**	Natural veld with heavy alien infestation **% = 40**	Veld dominated by alien species **% = 18**	Landscaped (vegetation) % = 0
Sport field % = 0	Cultivated land % = 0	Paved surface (hard landscaping) **% = 6**	Building or other structure **% = 11**	Bare soil % = 0

Please note: The Department may request specialist input/studies depending on the nature of the groundcover and potential impact(s) of the proposed activity/ies.

Are there any rare or endangered flora or fauna species (including red list species) present on the site	NO

If YES, specify and explain:

Are there any rare or endangered flora or fauna species (including red list species) present within a 200m (if within urban area as defined in the Regulations) or within 600m (if outside the urban area as defined in the Regulations) radius of the site.	YES

If YES, specify and explain:

One SCC, the Cape Vulture (*Gyps coprotheres;* Globally Vulnerable and Regionally Endangered) was recorded flying over the site during the field surveys.

Habitat suitability modelling indicates small areas of suitable breeding habitat for African Grass Owls (Regionally Vulnerable) in the proposed Development Area. The model was informed by known African Grassland Owl localities and breeding sites. Key wetland habitats that could potentially be used by African Grass Owl were identified from a presence locality dataset provided by Craig Whittington-Jones (GDARD Ornithologist) and supplemented with other known records of African Grass Owl breeding sites.

Despite the model indicating potential suitable breeding habitat for African Grass Owls, the identified wetland areas are small and are further impacted by high levels of anthropogenic disturbance (adjacent roads N14/R24 intersection and associated pedestrian traffic). Within the broader area, the model identified larger and more continuous patches of suitable African Grass Owl habitat further afield from the Development Area.

Are there any special or sensitive habitats or other natural features present on the site?	YES

If YES, specify and explain:

Sensitive areas coincide with the delineated wetland zones and the associated buffer zones that are located within the southern areas of the survey property. The ridge and grassland area located outside of the property along the eastern boundary, which coincides with the designed CBA area, is also designated as an ecologically sensitive area. The ecologically sensitive area at the western side of the survey property extends slightly northwards from the wetland buffer zone to include an area of natural grassland. The remainder of the survey property is regarded as being of low ecological sensitivity. The proposed development footprint remains within an area designated as being of low ecological sensitivity and will not significantly impact on any highly sensitive ecological features associated with the site.

The Development Area and the immediate environment contain several drainage lines and associated wetlands which are sources of surface water and habitat for a range of species. It is necessary to leave open space with no solar panels for birds utilising this habitat. The buffer zones as recommended by the Freshwater Specialist (i.e. 30m) should be followed as it will also benefit the avifauna that use this habitat. The Development Footprint does not overlap with the identified avifaunal sensitivities.

Was a specialist consulted to assist with completing this section: YES

If yes complete specialist details

Name of the specialist:	Albert Froneman
Qualification(s) of the specialist:	M.Sc. in Conservation Biology from the University of Cape Town
Postal address:	30 Roosevelt Street, Robindale, Randburg
Postal code:	2194
Telephone:	[redacted] Cell: 082 901 4016
E-mail:	Albert."901 4016
E-mail:	Albert.froneman@gmail.com Fax: [redacted]

Are any further specialist studies recommended by the specialist? NO

If YES, specify: [redacted]

If YES, is such a report(s) attached? [redacted]

If YES list the specialist reports attached below

[redacted]

Signature of specialist: Date: 2023 / 08 / 29

Name of the specialist:	Mathew Ross
Qualification(s) of the specialist:	PhD – Aquatic Health (University of Johannesburg).
Postal address:	PO Box 369, Wendywood
Postal code:	2144
Telephone:	[redacted] Cell: 082 293 5752
E-mail:	mat"293 5752
E-mail:	mathew@enviross.co.za Fax: [redacted]

Are any further specialist studies recommended by the specialist? NO

If YES, specify: [redacted]

If YES list the specialist reports attached below

[redacted]

Signature of specialist: [signature] Date: 29 AUG 2023.

Please note; If more than one specialist was consulted to assist with the filling in of this section then this table must be appropriately duplicated.

Please note; If more than one specialist was consulted to assist with the filling in of this section then this table must be appropriately duplicated.

8. LAND USE CHARACTER OF SURROUNDING AREA

Using the associated number of the relevant current land use or prominent feature from the table below, fill in the position of these land-uses in the vacant blocks below which represent a 500m radius around the site

1. Vacant land	2. River, stream, wetland	3. Nature conservation area	4. Public open space	5. Koppie or ridge
6. Dam or reservoir	7. Agriculture	8. Low density residential	9. Medium to high density residential	10. Informal residential
11. Old age home	12. Retail	13. Offices	14. Commercial & warehousing	15. Light industrial
16. Heavy industrial[AN]	17. Hospitality facility	18. Church	19. Education facilities	20. Sport facilities
21. Golf course/polo fields	22. Airport[N]	23. Train station or shunting yard[N]	24. Railway line[N]	25. Major road (4 lanes or more)[N]
26. Sewage treatment plant[A]	27. Landfill or waste treatment site[A]	28. Historical building	29. Graveyard	30. Archaeological site
31. Open cast mine	32. Underground mine	33.Spoil heap or slimes dam[A]	34. Small Holdings	
Other land uses (describe):				

NOTE: Each block represents an area of 250m X 250m, if your proposed development is larger than this please use the appropriate number and orientation of hashed blocks

NORTH

25	**34**	**34**	**34**	**1**
34	**25**	**34**	**1**	**1**
7	**7**	**7**	**1**	**1**
7	**25; 7**	**7**	**1; 25**	**1; 25**
25; 7	**7**	**7**	**9**	**9**

WEST **EAST**

SOUTH

= Site

Note: More than one (1) Land-use may be indicated in a block

Please note: The Department may request specialist input/studies depending on the nature of the land use character of the area and potential impact(s) of the proposed activity/ies. Specialist reports that look at health & air quality and noise impacts may be required for any feature above and in particular those features marked with an "A" and with an "N" respectively.

Have specialist reports been attached	YES
If yes indicate the type of reports below	

Terrestrial Ecology Impact Assessments
Surface Water Ecosystems Impact Assessments
Avifauna Impact Assessment
Soil and Agricultural Potential Compliance Statement
Heritage (including archaeology and palaeontology)
Transport Impact Assessment
Visual Impact Assessment
Social Impact Assessment

9. SOCIO-ECONOMIC CONTEXT

Describe the existing social and economic characteristics of the area and the community condition as baseline information to assess the potential social, economic and community impacts.

Location characteristics

- The project is proposed within the Gauteng Province, which shares domestic borders with the Free State, North West, Limpopo, and Mpumalanga, Provinces.
- The project is proposed within the City of Mogale LM of the West Rand DM.
- The City of Mogale LM is approximately 1,342 km² in extent.

Population characteristics

- Mogale City LM has a population of 421 087, and in the West Rand DM, 900,806 as of 2020.
- Between 2016-2020 an average positive growth rate of 1.2% was observed for the DM, with a further 1.4% expected between 2021-2024. Similarly for the LM a positive growth of 1.7%, and expected growth of 1.5%, recorded respectively.
- According to the Census 2011, the significant majority of 75.6% of the LM population are Black African, followed secondly by 21% which are White, 0.8% which are Coloured, and finally 2.2% Indian / Asian.
- The LM has a median age of 30, which is similar to the DM (30) and Provincial figure (29). The majority of people are between 18-64 at 66%. While a further 28% are under 18 and the remaining 6% are over 65.
- Setswana is the most spoken language at home at 35%, followed then by Afrikaans (16%), IsiZulu (11%), IsiXhosa (9%), English (9%), Sesotho (5%), and finally other (15%).
- Regarding migration, 92.7% of residents that migrated to the area are born in South Africa, 6% have migrated from SADC countries. Around 95% have South African citizenship.

Economic, education and household characteristics

- Employment levels in the LM is 44%. Female employment add-up to 44,37% and male are 51,35% over the review period (2020). Unemployment rate remained at 47% which is way above National unemployment rate of 30%.
- The 2011 census suggested that the LM employment are was 51.8% for the LM, 29,72% for the DM, and 50.59% for the province.
- As of 2011 the average annual income in the LM area was R30 000, with the West Rand at R57 500 and the Provincial average being R57 500.
- Education levels as reported in the 2016 Community Survey showed 76.5% of persons in the LM completed Grade 9 or higher. The DM has similar results at 73.54% and 78.66% for Gauteng.
- Nearly 50% of persons in the LM completed matric or higher during the same period.
- School attendance was at 94.5% for children aged 5 to 17 in the LM, with similar number in the DM and Province.
- With an average household of 2.6, 147,153 households were recorded in the LM in 2016.
- Of these households 32.3% are female headed.
- 76% are considered formal dwellings in 2016, compared to 73,5% in 2011.
- Nearly 45% of households are owned or in the process of being paid off in the LM.

Services

- The LM has 91.3% of houses getting water from a regional or local service provider, while the DM has 91.89%, and the province has 96.8%.
- Around 10.7% of the population have no access to electricity in the LM, 13.66% in the DM, and 7.36% in the Province.
- Close to 90% of the population has access to flush or chemical toilets in the LM, compared to 87% in the DM, and nearly 90% in the province.
- Refuse removal services are available to 85.9% of households, either through local authorities, private company or community members in the LM. Similar service availability can be seen at the DM and provincial level at 83% and 88% respectively.

10. CULTURAL/ HISTORICAL FEATURES

Please be advised that if section 38 of the National Heritage Resources Act 25 of 1999 is applicable to your proposal or alternatives, then you are requested to furnish this Department with written comment from the South African Heritage Resource Agency (SAHRA) – Attach comment in appropriate annexure *38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as-*

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;

(b) the construction of a bridge or similar structure exceedi€50m in length;

(c) any development or other activity which will change the character of a site-

(i) exceeding 5 000 m2 in extent; or

(ii) involving three or more existing erven or subdivisions thereof; or

(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or

(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources

authority;

(d) the re-zoning of a site exceeding 10 000€ in extent; or

(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

Are there any signs of culturally (aesthetic, social, spiritual, environmental) or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or close (within 20m) to the site? If YES, explain:	[redacted] NO

[redacted]

If uncertain, the Department may request that specialist input be provided to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist if one was already appointed:

The greater landscape of the study area is transformed, characterised by agricultural activities and urban development therefore this highly developed landscape is not considered to have a high visual quality. While the cultural value of the development area is moderate, the location of the facility within the COHWHS buffer zone, and at the junction of the N14 and the R24 adds to the cultural landscape significance of this site. Recommendations are made below in order to mitigate negative impacts to the cultural landscape significance of the area.

Even though the broader area is rich in history, no significant archaeological heritage resources were identified during the field assessment. No Stone Age or Iron Age heritage resources of significance were identified during the survey. In addition, no structures of cultural value or graves were identified. As such, this development is not considered to be a sensitive archaeological landscape.

Based on the nature of the project, surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are the correct age and type to preserve fossils. The site visit and walk through confirmed that there were no fossils in the project footprint. Since there is an extremely small chance that trace fossils from the Malmani Subgroup may be disturbed a Fossil Chance Find Protocol added to the HIA report must be implemented. Taking account of the defined criteria, the potential impact to fossil heritage resources is extremely low.

On condition that the recommendations outlined below are implemented, there is no objection to the proposed development from a heritage perspective.

Recommendations:

Based on the outcomes of the HIA report, it is not anticipated that the proposed development of the solar energy facility and its associated infrastructure will negatively impact on significant heritage resources on condition that:

- A 250m no development buffer should be implemented along the N14. The layout provided complies with this requirement.
- Specific engagement with the MA for the COHWHS should take place regarding development within the identified WHS buffer.

- The Chance Fossil Finds Procedure must be implemented for all excavation activities.
- Although all possible care has been taken to identify sites of cultural importance during the investigation of the study area, it is always possible that hidden or subsurface sites could be overlooked during the assessment. If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils, burials or other categories of heritage resources are found during the proposed development, work must cease in the vicinity of the find and SAHRA must be alerted immediately to determine an appropriate way forward.

Will any building or structure older than 60 years be affected in any way?	NO
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	NO
If yes, please attached the comments from SAHRA in the appropriate Appendix	

SECTION C: PUBLIC PARTICIPATION (SECTION 41)

10. The Environmental Assessment Practitioner must conduct public participation process in accordance with the requirement of the Ens, 2014.

2. LOCAL

11. **AUTHORITY PARTICIPATION**

Local authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of the application at least thirty (30) calendar days before the submission of the application to the competent authority.

Was the draft report submitted to the local authority for comment?	YES
If yes, has any comments been received from the local authority?	YES

If "YES", briefly describe the comment below (also attach any correspondence to and from the local authority to this application):

A Basic Assessment Report was prepared by Savannah Environmental and made available for a 30-day public review period from 30 August 2023 – 02 October 2023. Based on the comments provided in the letter received 30 September 2023 from the GDARD, the listed activities within the Basic Assessment Report have been updated,

The correction of the listed activities will result in the inclusion of additional information that was not applicable to this report consulted on during the initial public participation process. Therefore, in terms of Regulation 19(1)(b), the revised report will be subjected to another public participation process of 30 days, from 10 October to 10 November 2023.

This is the Revised Draft Basic Assessment Report which will be submitted for review and comments to the Local Authority. Any comments received will be included into the Final Basic Assessment Report.

If "NO" briefly explain why no comments have been received or why the report was not submitted if that is the case.

~~This is the Draft Basic Assessment Report which will be submitted for review and comments to the Local Authority. Any comments received will be included into the Final Basic Assessment Report.~~

3. CONSULTATION WITH OTHER STAKEHOLDERS

Any stakeholder that has a direct interest in the activity, site or property, such as servitude holders and service providers, should be informed of the application at least **thirty (30) calendar days** before the submission of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?	NO

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

If "NO" briefly explain why no comments have been received

This is the Draft Basic Assessment Report which will be made available for review and comments. Any comments received will be included into the Final Basic Assessment Report.

4. GENERAL PUBLIC PARTICIPATION REQUIREMENTS

The Environmental Assessment Practitioner must ensure that the public participation process is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees and ratepayers associations. Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was flawed.

The EAP must record all comments and respond to each comment of the public / interested and affected party before the application report is submitted. The comments and responses must be captured in a Comments and Responses Report as prescribed in the regulations and be attached to this application.

5. APPENDICES FOR PUBLIC PARTICIPATION

All public participation information is to be attached in the appropriate Appendix. The information in this Appendix is to be ordered as detailed below:

Appendix 1 – Proof of site notice
Appendix 2 – Written notices issued as required in terms of the regulations
Appendix 3 – Proof of newspaper advertisements
Appendix 4 –Communications to and from interested and affected parties
Appendix 5 – Minutes of any public and/or stakeholder meetings
Appendix 6 - Comments and Responses Report
Appendix 7 –Comments from I&APs on Basic Assessment (BA) Report
Appendix 8 –Comments from I&APs on amendments to the BA Report
Appendix 9 – Copy of the register of I&APs

SECTION D: RESOURCE USE AND PROCESS DETAILS

Note: Section D is to be completed for the proposal and alternative(s) (if necessary)

Instructions for completion of Section D for alternatives

1) For each alternative under investigation, where such alternatives will have different resource and process details (e.g. technology alternative), the entire Section D needs to be completed
4) Each alterative needs to be clearly indicated in the box below
5) Attach the above documents in a chronological order

Section D has been duplicated for alternatives	**0**	times	(complete only when appropriate)

Section D Alternative No. [redacted] (complete only when appropriate for above)

1. WASTE, EFFLUENT, AND EMISSION MANAGEMENT

Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	YES [redacted]
If yes, what estimated quantity will be produced per month?	To be determined

How will the construction solid waste be disposed of (describe)?

Solid / General Waste will be generated during the 3 – 4 month construction period. The waste management hierarchy will be applied. The waste management hierarchy consists of options for waste management during the lifecycle of waste, arranged in descending order of priority: waste avoidance and reduction, re-use and recycling, recovery, and treatment and disposal as the last resort.

In terms of specific waste streams, the major waste streams during the Construction Phase are:

- Cardboard waste from the panels. Provision has been made in the project EMPr (Appendix H) for the use of a compactor to compress the cardboard boxes in which the PV panels are stored.
- Rubber caps placed on all eight corners of the PV panels – volumes uncertain.
- Wooden pallets on which the PV boxes arrive.
- Plastic wrap.
- Potentially Hazardous Waste (Provision will be made for hazardous waste – dependent on the Design / Type of panel procured).

The majority of the solar panels can be recovered and re-used or recycled. Recyclable materials will be transported off-site by truck and managed at appropriate facilities in accordance with relevant waste management regulations. No waste materials will be left on-site.

Waste material which cannot be recycled shall be disposed of at an appropriately licensed waste disposal site or as required by the relevant legislation.

Where will the construction solid waste be disposed of (describe)?

Construction solid waste which cannot be recycled will be disposed of at the nearest appropriately licensed landfill site.

Will the activity produce solid waste during its operational phase?	YES
If yes, what estimated quantity will be produced per month?	` To be determined

How will the solid waste be disposed of (describe)?

Waste during operational phase will be minimal. Any waste which cannot be recycled will be disposed of at the nearest appropriately licensed landfill site.

Has the municipality or relevant service provider confirmed that sufficient air space exists for treating/disposing of the solid waste to be generated by this activity?	NO

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

N/A

Note: If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?	NO

If yes, inform the competent authority and request a change to an application for scoping and EIA.

Is the activity that is being applied for a solid waste handling or treatment facility?	NO

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Describe the measures, if any, that will be taken to ensure the optimal reuse or recycling of materials:

The waste management hierarchy will be applied. The waste management hierarchy consists of options for waste management during the lifecycle of waste, arranged in descending order of priority: waste avoidance and reduction, re-use and recycling, recovery, and treatment and disposal as the last resort. Waste material which cannot be recycled shall be disposed of at an appropriately licensed waste disposal site or as required by the relevant legislation.

Liquid effluent (other than domestic sewage)

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	NO
If yes, what estimated quantity will be produced per month?	
If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the liquid effluent to be generated by this activity(ies)?	

Will the activity produce any effluent that will be treated and/or disposed of on site?	NO
If yes, what estimated quantity will be produced per month?	

If yes describe the nature of the effluent and how it will be disposed.

Note that if effluent is to be treated or disposed on site the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA

Will the activity produce effluent that will be treated and/or disposed of at another facility? NO

If yes, provide the particulars of the facility:

Facility name:
Contact person:
Postal address:
Postal code:
Telephone: Cell:
E-mail: Fax:

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

Construction Phase

Conservancy Tanks (up to 16 000 L in capacity which are cleaned once a month and disposed of at the nearest municipal facility).

Operations Phase

Septic Tanks (up to 16 000 L in capacity which are cleaned 2/3 times a week). New Clarisfusion System (up to 16 000 L capacity which are cleaned once every six months) which utilises a chemical process to recycle water from the Operations and Maintenance Buildings as well as Sub-Station Buildings. This water can then be stored in conservancy tanks and used to water vegetation.

Liquid effluent (domestic sewage)

Will the activity produce domestic effluent that will be disposed of in a municipal sewage system? NO

If yes, what estimated quantity will be produced per month? m^3

If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the domestic effluent to be generated by this activity(ies)? YES NO

Will the activity produce any effluent that will be treated and/or disposed of on site? NO

If yes describe how it will be treated and disposed off.

Emissions into the atmosphere

Will the activity release emissions into the atmosphere? NO

If yes, is it controlled by any legislation of any sphere of government?

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the emissions in terms of type and concentration:

2. WATER USE

Indicate the source(s) of water that will be used for the activity

municipal	Directly from water board	groundwater	river, stream, dam or lake	other	the activity will not use water

The following options are being considered:

1. Registered services provider transporting water to site by means of water tankers/ or municipal bulk infrastructure pipelines
2. Existing boreholes on the site
3. Surface water abstraction

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate
the volume that will be extracted per month:

3 750 Kl during construction 1 250 Kl during operation

If Yes, please attach proof of assurance of water supply, e.g. yield of borehole, in the appropriate Appendix

This information is not yet available. This will be obtained and provided to DWS as part of the Water Use Application.

Does the activity require a water use permit from the Department of Water Affairs?	YES

If yes, list the permits required

A Water Use Application has not yet been submitted for the proposed development. Only once the development reaches the Bid Award phase for either public or private program will a final layout be confirmed, and a Water Use Application submitted.

If yes, have you applied for the water use permit(s)?	NO
If yes, have you received approval(s)? (attached in appropriate appendix)	NO

3. POWER SUPPLY

Please indicate the source of power supply eg. Municipality / Eskom / Renewable energy source

Municipal power supply

If power supply is not available, where will power be sourced from?

To be confirmed

4. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

The facility will generate clean green renewable energy through photovoltaic solar technologies.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

The facility will optimise energy use through the following means:
Consult a lighting engineer in the design and planning of lighting to ensure the correct specification and placement of lighting and light fixtures for the PV Facility and the ancillary infrastructure. The following is recommended:

- Make use of minimum lumen or wattage in fixtures.
- Make use of Low-Pressure Sodium lighting or other low impact lighting.

Make use of motion detectors on security lighting, so allowing the site to remain in darkness until lighting is required for security or maintenance purposes.

SECTION E: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts as well as the impacts of not implementing the activity (Section 24(4)(b)(i).

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summarise the issues raised by interested and affected parties.

No issues have been raised to date. Comments received during the review period for the draft BAR will be recorded and included in the final BAR.

Summary of response from the practitioner to the issues raised by the interested and affected parties (including the manner in which the public comments are incorporated or why they were not included)
(A full response must be provided in the Comments and Response Report that must be attached to this report):

To be completed following 30 day review period

2. IMPACTS THAY MAY RESULT FROM THE CONSTRUCTION AND OPERATIONAL PHASE

Briefly describe the methodology utilised in the rating of significance of impacts

Impact significance has been assessed in terms of the following criteria:

- The **nature**, a description of what causes the effect, what will be affected, and how it will be affected;
- The **extent**, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score of between 1 and 5 is assigned as appropriate (with a score of 1 being low and a score of 5 being high);
- The **duration**, wherein it is indicated whether:
  - The lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
  - The lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
  - Medium-term (5–15 years) – assigned a score of 3;
  - Long term (> 15 years) - assigned a score of 4;
  - Permanent - assigned a score of 5.
- The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
  - 0 is small and will have no effect on the environment;
  - 2 is minor and will not result in an impact on processes;
  - 4 is low and will cause a slight impact on processes;
  - 6 is moderate and will result in processes continuing but in a modified way;
  - 8 is high (processes are altered to the extent that they temporarily cease);
  - 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability of occurrence**, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned:

- Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
- Assigned a score of 2 is improbable (some possibility, but low likelihood);
- Assigned a score of 3 is probable (distinct possibility);
- Assigned a score of 4 is highly probable (most likely);
- Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).

» The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high;
» The **status**, which is described as either positive, negative or neutral;
» The degree to which the impact can be reversed;
» The degree to which the impact may cause irreplaceable loss of resources;
» The degree to which the impact can be mitigated.

The **significance** is determined by combining the criteria in the following formula:

S = (E+D+M) P; where

S = Significance weighting.
E = Extent.
D = Duration.
M = Magnitude.
P = Probability.

The **significance weightings** for each potential impact are as follows:

» **< 30 points:** Low (i.e. where this impact would not have a direct influence on the decision to develop in the area);
» **30-60 points:** Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated);
» **> 60 points:** High (i.e. where the impact must have an influence on the decision process to develop in the area).

The study also considers cumulative impacts associated with similar developments within a 30km radius of the proposed project. The purpose of the cumulative assessment is to test if such impacts are relevant to the proposed project in the proposed location (i.e. whether the addition of the proposed project in the area will increase the impact). In this regard, studies considered whether the construction of the proposed development will result in:

» Unacceptable risk
» Unacceptable loss
» Complete or whole-scale changes to the environment or sense of place
» Unacceptable increase in impact

Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the construction phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

Proposal

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
Terrestrial Ecology				
Destruction of sensitive habitat within areas designated as high ecological sensitivity (both terrestrial and wetland areas). This impact has limited significance as the proposed PV footprint area does not coincide with ecologically sensitive habitat features.	**Low negative (16)**	» The ecologically sensitive features have been delineated and mapped. » Conservation buffer zones have also been designated to these areas. » Indiscriminate habitat destruction to be avoided and the proposed development should remain as localised as possible (including support areas and services). This will ensure the limiting of soil disturbances that could result in erosion that could impact on areas further afield. » Erosion must be strictly controlled through the utilization of silt traps, silt fencing, etc. This is especially pertinent within areas of steeper gradients. » Topsoil stockpiles should be protected from erosion through the utilization of silt traps, silt fencing, etc. » Areas currently suffering from the effects of soil erosion should be stabilised and rehabilitated as part of the development strategy.	**Low negative (4)**	» Wetland units are located some distance from the proposed development footprint area and therefore any impacts to the wetland areas would be an indirect feature. The significance of this is therefore limited. » The same is true for the natural grassland areas included within the ecological sensitivity mapping. » Indiscriminate destruction of ecologically sensitive features, as well as areas of natural vegetation, will result in a higher significance of this feature. » Soil stripping, soil compaction and vegetation removal will increase rates of erosion and lead to smothering of lower lying areas and surrounding watercourses. » Little to no residual risks to ecologically sensitive habitat will remain given the application of the described mitigation measures.
Destruction of faunal and floral species resulting from vegetation stripping and topsoil	**Medium negative (45)**	» The ecologically sensitive features have been delineated and mapped.	**Medium negative (35)**	» The stripping of vegetation will result in the direct destruction of vegetation and any ground-

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
removal within the PV footprint area.		» Indiscriminate habitat destruction to be avoided and the proposed development should remain as localised as possible (including support areas and services). This will limit the ecological impacts outside of the development zones. » Once the PV site has been established, indigenous vegetation should be re-established where the infrastructure allows for it.		dwelling faunal species within the area of influence. It will also result in the displacement of sensitive species from the larger area due to site disturbances. The development footprint it to be largely limited to an area that has suffered considerable ecological transformation and the vegetation within the area is largely dominated by exotic species. As this has already depleted the level of biodiversity within the area, the significance of this impacting features is low. » Indiscriminate destruction of ecologically sensitive features, as well as areas of natural vegetation, will result in a higher significance of this feature.
Impacts to species of conservational concern resulting from individuals being include in the vegetation stripping and topsoil storage processes.	**Low negative (10)**	» Thorough site searches should be undertaken prior to vegetation stripping to allow for a rescue strategy for SCC to be implemented. » Indiscriminate habitat destruction outside of the footprint area should be avoided as far as possible.	**Low negative (4)**	» The stripping of vegetation could potentially inadvertently impact on SCC. This is, however, highly unlikely within the area that has been proposed for the PV infrastructure footprint due to the largescale transformation of the site. This features therefore has limited significance to the project. » Little to no residual risks will remain given the application of

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
				the mitigation measures described above.
Impacts to ecological processes leading to ecological degradation.	**Medium negative (45)**	» The ecologically sensitive features have been delineated and mapped. » Indiscriminate habitat destruction to be avoided and the proposed development should remain as localised as possible (including support areas and services). This will limit the ecological impacts outside of the development zones. » Once the PV site has been established, indigenous vegetation should be re-established where the infrastructure allows for it.	**Medium negative (35)**	» The stripping of vegetation will result in the direct destruction of vegetation and any ecological processes associated with it. Pollination, seed dispersal and germination, provision of nesting material and sites for faunal species within the vegetation, decomposition of dead organic matter and nutrient cycling, and other biodiversity interactions would all be impacted. The development footprint is dominated by an area historically transformed, resulting the almost total dominance of exotic flora and a highly transformed vegetation structure. Natural ecological processes have largely been lost due to this. Although some ecological processing functionality does take place at present, this impact has limited significance to the project. » Indiscriminate destruction of ecologically sensitive features, as well as areas of natural vegetation, will result in a higher significance of this feature

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
Soil erosion.	**Low negative (16)**	» Erosion must be strictly controlled through the utilization of silt traps, silt fencing, etc. This is especially pertinent within areas of steeper gradients. » Topsoil stockpiles should be protected from erosion through the utilization of silt traps, silt fencing, etc. » Stormwater management must be regarded as an ongoing concern and outfall structures must be designed to include energy dissipating features. » Flood attenuation should be considered through the establishment of an attenuation pond that would allow for controlled release of the stormwater into the wetland unit.	**Low negative (4)**	» An increase in the hard and impervious surfaces within the local area, which inhibit stormwater percolation into the soils and eventual groundwater recharge, will increase the surface water runoff potential and possibly result in soil erosion. » The destabilisation of soils will result in displacement of biodiversity unless a suitable stormwater management plan is engineered for the site. Little to no residual risks will remain given the application of the mitigation measures described above.
Ongoing management of the site will require the use of herbicides, maintenance of vegetation, and other features that could impact on non-target processes.	**Low negative (16)**	» Soil erosion must be managed as an ongoing concern throughout the development process. » Herbicide usage at the site must be strictly controlled and regulated, with adequate training provided to application staff. Herbicides to be stored in an appropriate lockable place to avoid use by uninformed and untrained personnel. Herbicide application should only be done when no rain is forecast for the	**Low negative (4)**	» Herbicides used on the PV site for routine vegetation management could impact on non-target areas due to incorrect or indiscriminate application. These biocides be transported to the aquatic environment, where it will impact on aquatic biota.

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
		area. It is preferable to avoid windy days. Only registered herbicides to be used. Manufacturer's dosage directions (mixing concentrations, application methods and frequency) are to be strictly adhered to. Over-application and higher than necessary		
Avifauna				
Displacement of priority species due to disturbance associated with construction of the Quantum 1 SEF and associated infrastructure.	**Medium negative (55)**	» Construction activity should be restricted to the immediate footprint of the infrastructure as far as possible. » Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of solar priority species. » The African Grass Owl habitat buffers as indicated in the Avifaunal report should be maintained. » Measures to control noise and dust should be applied according to current best practice in the industry. » Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. » The recommendations of the ecological and botanical	**Medium negative (45)**	» Displacement of priority species due to disturbance associated with construction of the SEF and associated infrastructure. The residual risk of displacement will be reduced but remain at a medium level after mitigation, if the proposed mitigation is implemented.

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
		specialist studies must be strictly implemented, especially as far as limitation of the construction footprint is concerned.		
Displacement of priority species due to habitat transformation associated with construction of the Quantum 1 SEF and associated infrastructure.	**High negative (65)**	» The African Grass Owl habitat buffers as indicated in the Avifaunal report should be maintained. » Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum. » The mitigation measures proposed by the biodiversity and vegetation specialists must be strictly implemented.	**Medium negative (45)**	» Displacement of priority species due to habitat transformation associated with construction of the SEF and associated infrastructure. The residual risk of displacement will be reduced after mitigation but will remain for some species due to the change in habitat.
Mortality of priority species due to collisions with solar panels.	**Low negative (20)**	» Due to the expected low significance of this impact, no mitigation measures are recommended.	**Low negative (20)**	» Due to the expected low significance of this impact, no mitigation measures are recommended.
Mortality of priority species due to electrocution on the medium voltage internal reticulation networks and substation.	**Medium negative (42)**	» Use underground cables as much as possible. » A raptor-friendly pole design must be used, and the pole design must be approved by the avifaunal specialist. » The hardware within the proposed substation yards is too complex to warrant any mitigation for electrocution at this stage. It is recommended that if on-going impacts are recorded once operational, site-specific	**Low negative (10)**	» Mortality of priority species due to electrocution on the internal medium voltage powerline. Entrapment of large-bodied birds in the double perimeter fence. The residual risk of electrocution will be low once mitigation is implemented.

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
		mitigation (insulation) be applied reactively. This is an acceptable approach because Red List priority species are unlikely to frequent the substation and be electrocuted.		
Mortality of priority species due to collisions with the medium voltage internal reticulation networks	**Medium negative (36)**	» Use underground cables as much as possible. » All internal medium voltage lines must be marked with Eskom approved Bird Flight Diverters according to the latest official Eskom Engineering Instruction.	**Low negative (20)**	» Mortality of priority species due to collisions with the internal medium voltage powerline. The residual risk of collision will still be present for Ludwig's Bustard, but significantly reduced for other species.
Freshwater				
Destruction of sensitive habitat within areas designated as high ecological sensitivity.	**Low negative (16)**	» The ecologically sensitive features have been delineated and mapped. » Conservation buffer zones have also been designated to these areas. » Indiscriminate habitat destruction to be avoided and the proposed development should remain as localised as possible (including support areas and services). This will ensure the limiting of soil disturbances that could result in erosion that could see sediment being transported toward the wetland areas. » Erosion must be strictly controlled through the utilization of silt traps, silt fencing, etc. This is especially	**Low negative (4)**	Indirect Impact » Wetland units are located some distance from the proposed development footprint area and therefore any impacts to the wetland areas would be an indirect feature. The significance of this is therefore limited. » Soil erosion will affect any unprotected soils that have suffered disturbances, including unprotected stockpiles of stored topsoil. » Stormwater drainage features will also induce erosion impacts. » Soil stripping, soil compaction and vegetation removal will increase rates of erosion and entry of sediment into the

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
		pertinent within areas of steeper gradients. » Topsoil stockpiles should be protected from erosion through the utilization of silt traps, silt fencing, etc. » Areas currently suffering from the effects of soil erosion should be stabilised and rehabilitated as part of the development strategy.		general environment and surrounding watercourses.
Impacts to water quality within surface water ecosystems.	**Low negative (16)**	» No fuel to be stored at or near watercourses or waterbodies; » Equipment to be properly maintained and serviced; » Fuel storage and pump areas to be bunded to avoid accidental leakage; » No refuelling should be done within the riparian zones (exceptions are made for stationery motors i.e. pumps); » Accidental spills must be reported and cleaned immediately. Contaminated soils must be removed and disposed of at a registered disposal site. » Soil erosion must be managed as an ongoing concern throughout the development process.	**Low negative (4)**	Indirect Impact » Impacts to water quality include accidental fuel/oil spills from poorly maintained equipment, accidents, or container failure, and poorly managed and/or non- bunded fuelling stations. » Water quality impacts will also occur because of unabated soil erosion.
Soil erosion.	**Low negative (16)**	» Erosion must be strictly controlled through the utilization of silt traps, silt fencing, etc. This is especially	**Low negative (4)**	» Indirect Impact » Soil erosion will impact any unprotected soils that have suffered disturbances, including

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
		pertinent within areas of steeper gradients. » Topsoil stockpiles should be protected from erosion through the utilization of silt traps, silt fencing, etc. » Stormwater management must be regarded as an ongoing concern and outfall structures must be designed to include energy dissipating features. » Flood attenuation should be considered through the establishment of an attenuation pond that would allow for controlled release of the stormwater into the wetland unit.		unprotected stockpiles of stored topsoil. » Soil stripping, soil compaction and vegetation removal will increase rates of erosion and entry of sediment into the general environment and surrounding watercourses. » Poor stormwater management will induce erosion.
Impacts to water quality within surface water ecosystems.	**Low negative (16)**	» No fuel to be stored at or near watercourses or waterbodies; Equipment to be properly maintained and serviced; Fuel storage and pump areas to be bunded to avoid accidental leakage; No refuelling should be done within the riparian zones (exceptions are made for stationery motors i.e. pumps); » Accidental spills must be reported and cleaned immediately. Contaminated soils must be removed and disposed of at a registered disposal site.	**Low negative (4)**	Indirect Impact » Impacts to water quality include accidental fuel/oil spills from poorly maintained equipment, accidents, or container failure, and poorly managed and/or non- bunded fuelling stations. » Water quality impacts could also occur because of unabated soil erosion. » Herbicides used on the PV site for routine vegetation management could be transported to the aquatic environment, where it will impact on aquatic biota.

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
		» Soil erosion must be managed as an ongoing concern throughout the development process. » Herbicide usage at the site must be strictly controlled and regulated, with adequate training provided to application staff. Herbicides to be stored in an appropriate lockable place to avoid use by uninformed and untrained personnel. Herbicide application should only be done when no rain is forecast for the area. It is preferable to avoid windy days. Only registered herbicides to be used. Manufacturer's dosage directions (concentration and application frequency) are to be strictly adhered to. Over-application and higher than necessary concentrations will increase the risk to the aquatic environment. Manual weed control should be encouraged over the use of herbicides.		
Heritage				
Impact on Cultural Landscape Heritage Resources by the Solar Energy Facility	**Low neutral (28)**	» A 250m no development buffer should be implemented along the N14 » Specific engagement with the MA for the COHWHS should take	**Low neutral (14)**	» The broader context of the area proposed for development has cultural significance that may be impacted by the proposed development

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
		place regarding development within the identified WHS buffer		
Impacts on Archaeological Heritage Resources impacted by the Solar Energy Facility	**Low neutral (7)**	» Although all possible care has been taken to identify sites of cultural importance during the investigation of the study area, it is always possible that hidden or subsurface sites could be overlooked during the assessment. If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils, burials or other categories of heritage resources are found during the proposed development, work must cease in the vicinity of the find and SAHRA must be alerted immediately to determine an appropriate way forward.	**Low neutral (7)**	» The area proposed for development is known to conserve heritage resources of archaeological significance that may be impacted by the proposed development
Paleontological Heritage Resources impacted by the Solar Energy Facility	**Low neutral (12)**	» The Chance Fossil Finds Procedure attached to the Heritage Impact Assessment must be implemented for all excavations	**Low neutral (12)**	» The area proposed for development is known to conserve heritage resources of palaeontological significance that may be impacted by the proposed development
Visual				
Visual impact of construction activities on sensitive visual	**High negative (64)**	» Retain and maintain natural vegetation in all areas outside of	**Moderate negative (42)**	» During the construction period, there will be an increase in heavy vehicles utilising the roads

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
receptors within 1km to the proposed PV facility.		the development footprint, but within the project site. » Ensure that vegetation is not unnecessarily removed during the construction period. » 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. » Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads. » Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed of regularly at licensed waste facilities. » Reduce and control construction dust using approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent). » Restrict construction activities to daylight hours whenever possible in order to reduce lighting impacts.		to the construction sites that may cause, at the very least, a visual nuisance to other road users and landowners in the area in close proximity (within 1km). Additionally, dust as a result of the construction activities and construction equipment (i.e. cranes), temporary laydown areas, construction camps, etc. may also be visible at the site, resulting in a visual impact occurring during construction. » Construction activities may potentially result in a high temporary visual impact, that may be mitigated to moderate. » No Residual impacts are expected provided that rehabilitation works are carried out as required.

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
		» Rehabilitate all disturbed areas immediately after the completion of construction works.		
Visual impact on sensitive visual receptors within 1km to the proposed PV facility during operation.	**High negative (72)**	Planning: » Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude, but within the project site. » Consult adjacent landowners (if present) in order to inform them of the development and to identify any (valid) visual impact concerns. Operations: » Maintain the general appearance of the facility as a whole. » Retain/re-establish and maintain natural vegetation (if present) immediately adjacent to the development footprint, where possible. » Investigate the potential to screen affected receptor sites (if applicable and located within 1km of the facility) with planted vegetation cover.	**Moderate negative (48)**	» Mitigation of this impact is possible and both specific measures as well as general "best practice" measures are recommended in order to reduce/mitigate the potential visual impact. » The visual impact will be removed after decommissioning, provided the facility infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.
Visual impact on sensitive visual receptors within a 1 – 3km radius of the proposed PV facility during operation.	**High negative (60)**	Planning: » Retain/re-establish and maintain natural vegetation in all areas outside of the development	**Moderate negative (39)**	» Mitigation of this impact is possible and both specific measures as well as general "best practice" measures are recommended in order to

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
		footprint/servitude, but within the project site. Operations: » Maintain the general appearance of the facility as a whole. » Retain/re-establish and maintain natural vegetation (if present) immediately adjacent to the development footprint, where possible. » Investigate the potential to screen affected receptor sites (if applicable and located within 1km of the facility) with planted vegetation cover.		reduce/mitigate the potential visual impact. » The visual impact will be removed after decommissioning, provided the facility infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.
Visual impact on observers travelling along the roads and residents at homesteads within a 3 – 6km radius of the facility during operation.	**Moderate negative (36)**	Planning: » Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude, but within the project site. Operations: » Maintain the general appearance of the facility as a whole. » Retain/re-establish and maintain natural vegetation (if present) immediately adjacent to the development footprint, where possible. » Investigate the potential to screen affected receptor sites (if	**Low negative (24)**	» Mitigation of this impact is possible and both specific measures as well as general "best practice" measures are recommended in order to reduce/mitigate the potential visual impact. » The visual impact will be removed after decommissioning, provided the facility infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
		applicable and located within 1km of the facility) with planted vegetation cover.		
Visual impact on observers travelling along the roads, residents at homesteads and protected areas beyond the 6km radius of the facility	**Low negative (18)**	Planning: » Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude, but within the project site. Operations: » Maintain the general appearance of the facility as a whole. » Retain/re-establish and maintain natural vegetation (if present) immediately adjacent to the development footprint, where possible. » Investigate the potential to screen affected receptor sites (if applicable and located within 1km of the facility) with planted vegetation cover.	**Low negative (9)**	» Mitigation of this impact is possible and both specific measures as well as general "best practice" measures are recommended in order to reduce/mitigate the potential visual impact. » The visual impact will be removed after decommissioning, provided the facility infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.
Visual impact of lighting at night on sensitive visual receptors.	**High negative (60)**	Planning & operation: » Shield the sources of light by physical barriers (walls, vegetation, or the structure itself). » Limit mounting heights of lighting fixtures, or alternatively use foot-lights or bollard level lights. » Make use of minimum lumen or wattage in fixtures.	**Moderate negative (39)**	» Mitigation of direct lighting impacts and sky glow entails the pro-active design, planning and specification of lighting for the facility. The correct specification and placement of lighting and light fixtures for the facility and the ancillary infrastructure (e.g. workshop and storage facilities)

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
		» Make use of down-lighters, or shielded fixtures. » Make use of Low-Pressure Sodium lighting or other types of low impact lighting. » 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.		will go far to contain rather than spread the light. » The visual impact will be removed after decommissioning, provided the facility infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.
The visual impact of solar glint and glare as a visual distraction and possible road travel hazard	**Moderate negative (32)**	Planning & operation: » Retain/re-establish and maintain natural vegetation (if present) immediately adjacent to the development footprint. » Use anti-reflective panels and dull polishing on structures, where possible and industry standard. » Adjust tilt angles of the panels if glint and glare issues become evident, where possible. » If specific sensitive visual receptors are identified during operation, investigate screening at the receptor site, where possible. » Investigate the possibility of creating a vegetated berm to screen users of roads from the facility.	**Low negative (16)**	» The R24 and N14 are located within a 1km radius of the proposed PV facility. This approximate distance is recommended as a threshold within which the visual impact of glint and glare (if there is visual line of sight from the road) may influence road users . A glint and glare assessment was conducted and the outcome was hat no glare was found for observers traveling along the N14, R24 or any runways within the vicinity. Therefore the potential visual impact related to solar glint and glare as a road travel hazard for users travelling south on the R24 is expected to be of moderate (rating = 32) significance and can be mitigated to low (rating = 16) significance. One airstrip, Davies

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
				Aircraft Corporation Flight School, was noted north of the proposed site within 1- 3km. As a result, it is recommended that that a Glint and Glare Assessment was undertaken to assess the impacts of the proposed PV Facility on this airfield. The Glint and Glare Assessment is included in **Appendix G8**. » The visual impact will be removed after decommissioning, provided the facility infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.
The visual impact of solar glint and glare on residents of homesteads within 1km to the PV facility	**High negative (64)**	Planning & operation: » Use anti-reflective panels and dull polishing on structures, where possible and industry standard. » If specific sensitive visual receptors are identified during operation, investigate screening at the receptor site, where possible. » Investigate the possibility of creating a vegetated berm to screen residents from the facility.	**Moderate negative (42)**	» Mitigation of this impact is possible and both specific measures as well as general "best practice" measures are recommended in order to reduce/mitigate the potential visual impact. » The visual impact will be removed after decommissioning, provided the facility infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
Visual impact of the ancillary infrastructure on observers in close proximity to the structures.	**Low negative (24)**	Planning: Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude, but within the project site. Operations: » Maintain the general appearance of the facility as a whole. » Retain/re-establish and maintain natural vegetation (if present) immediately adjacent to the development footprint, where possible. » Investigate the potential to screen affected receptor sites (if applicable and located within 1km of the facility) with planted vegetation cover.	**Low negative (24)**	» The anticipated visual impact resulting from this infrastructure is likely to be of low significance both before and after mitigation. » The visual impact will be removed after decommissioning, provided the ancillary infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.
The potential impact on the sense of place of the region.	**Moderate negative (33)**	Planning: » Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude, but within the project site. Operations: » Maintain the general appearance of the facility as a whole.	**Moderate negative (33)**	» No mitigation of this impact is possible (i.e. the structures will be visible regardless), but general mitigation and management measures are recommended as best practice. » The visual impact will be removed after decommissioning, provided the ancillary infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
Social				
Employment opportunities and skills development	**Low positive (24)**	» It is recommended that the local employment policy be adopted where possible to maximise the opportunities made available to the local labour force. » The project should make it a requirement for contractors to implement a 'locals first' policy, especially for semi and low skilled job categories., if this is not possible, then the broader focus areas should be considered for sourcing workers. » Employment opportunities will be for the immediate local area Mogale City Local Municipality, if this is not possible, then the broader focus areas should be considered for sourcing employees. » During the recruitment selection process, consideration must be given to women. » It is recommended that realistic local recruitment targets be set for the construction phase. » Training and skills development programmes should be initiated prior to the commencement of the construction phase	**Moderate positive (40)**	» The creation of employment opportunities and skills development opportunities during the construction phase for the country and local economy. Resulting in the improved pool of skills and experience in the local area.
Multiplier effects on the local economy	**Low positive (24)**	» It is recommended that a local procurement policy is adopted by	**Moderate positive (32)**	» Significant positive impacts from the economic multiplier effects

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
		the developer to maximise the benefit to the local economy, where feasible (Mogale City Local Municipality). » South Africa Mainstream Renewable Power Developments (Pty) Ltd should develop a database of local companies, specifically Historically Disadvantaged (HD) companies, which qualify as potential service providers (e.g. construction companies, catering companies, waste collection companies, security companies etc.) prior to the commencement of the tender process for construction contractors. These companies should be notified of the tender process and invited to bid for project-related work, where applicable. » It is a requirement to source as much goods and services as possible from the local area. » Engage with local authorities and business organisations to investigate the possibility of procurement of construction materials, goods and products from local suppliers, where feasible.		from the use of local goods and services. Improved local services sector and growth in local businesses.

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
Safety and Security	**Low negative (24)**	» Access in and out of the construction area should be strictly controlled by a security company. » The appointed EPC contractor must appoint a security company and appropriate security procedures are to be implemented. » The contractor must ensure that open fires on the site for heating, smoking or cooking are not allowed except in designated areas. » Contractor must provide adequate firefighting equipment on site and provide firefighting training to selected construction staff. » A comprehensive employee induction programme which covers land access protocols, fire management and road safety should be prepared. » A Community Liaison Officer should be appointed and an appropriate grievance mechanism implemented. A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any	**Low negative (10)**	» Temporary increase in safety and security concerns associated with the influx of people during the construction phase. Impact will be removed post construction.

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
		complaints or grievances with the construction process.		
Increased pressure on loacalised services and resources	**Low negative (27)**	» Preference should be given to local jobseekers to lessen the pressure on local services as there will not be a high number of people adding to the pressure on local services.	**Low negative (14)**	» Added pressure on economic and social infrastructure during construction as a result of in-migration of people is low.
Nuisance impacts (noise and dust)	**Moderate negative (40)**	» The movement of heavy vehicles associated with the construction phase should be timed to avoid weekends, public holidays and holiday periods where feasible. » Dust suppression measures must be implemented on site 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 when appropriate and practical. » Ensure all vehicles are road worthy, drivers are qualified and are made aware of the potential noise and dust issues. » A Community Liaison Officer (CLO) should be appointed. A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any	**Low Negative (16)**	» Nuisance impacts in terms of temporary increase in noise and dust, often associated with construction and the increase in heavy vehicles in the area can be mitigated to low.

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
		complaints or grievances with the construction process.		
Direct employment and skills development during operation	**Moderate positive (33)**	» A local employment policy should be adopted by the developer to maximise the project opportunities being made available to the local community. » Enhance employment opportunities for the immediate local area, Mogale City Local Municipality. If this is not possible, then the broader focus areas should be considered for sourcing employees. » The recruitment selection process should seek to promote gender equality and the employment of women wherever possible. The developer should establish vocational training programs for the local employees to promote the development of skills.	**Moderate positive (44)**	» The creation of employment opportunities and skills development opportunities during the operation phase for the country and local economy. An improved pool of skills and experience in the local area
Development of clean, renewable energy infrastructure	**Moderate positive (48)**	None	**Moderate positive (48)**	» Development of clean, renewable energy infrastructure. Reduce carbon emissions through the use of renewable energy and contribute to reducing global warming
Traffic				
Increase in trips on external roads due to transport of components, material and labour to site.	**Medium negative (36)**	» Source equipment, machinery and material locally as far as possible.	**Low negative (20)**	» The construction phase will generate traffic including transportation of people, construction materials, water,

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
Noise/dust pollution during transport and construction activities on site		» Stagger deliveries of components to site and scheduled to occur outside of peak traffic periods as much as possible. » Dust suppression of gravel roads close to and on site. » Regular maintenance of gravel roads located within the site boundary, including the access road to the site. » The use of quarries near the site as much as possible. » Staff trips to occur outside of main peak traffic periods as far as possible. Delivery Management Plan		and equipment (abnormal trucks transporting the transformers). The exact number of trips generated will be determined at a later stage. Based on the high-level screening of impacts, a negative low impact rating can be expected during the construction phase with mitigation measures
Slight increase of vehicle trips due to permanent staff traveling to site, periodically (bi-annual) trips to site for transport of water and irregular maintenance trips. Operational phase	**Low negative (20)**	» Source on-site water supply if possible and use cleaning systems for the panels needing less vehicle trips. » Schedule trips for the provision of water for the cleaning of panels outside peak traffic times as much as possible.	**Low negative (16)**	» The traffic generated during this phase will have a nominal impact on the surrounding road network.

Alternative 1 *(REPEAT THIS TABLE FOR EACH ALTERNATIVE)*

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**

No Go Alternative

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
Construction phase that entails vegetation stripping that will disturb soils and lead to potential mobilisation of silt and sediment that could reach the wetland and watercourse within the southern area of the project site, impacting on the ecological integrity of the unit	**Low-medium negative**	» The delineated area of the surface water ecosystems and associated conservation buffer zones detailed in the Freshwater Assessment must be regarded as out of bounds to contractors and equipment. » Equipment and vehicles to be serviced and regularly inspected for fluid leaks to limit the impact of hydrocarbon contamination of soils and potential contamination of the surface waters. » No dumping of any kind to take place within the delineated wetland zones and associated conservation buffers.	**Very low negative**	» The potential of the impact is regarded as being low-medium whereas the probability of this occurring is considered very low due to the distance between the construction footprint area and the wetland / watercourse and associated conservation buffer zone.

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

Terrestrial Biodiversity Impact Assessment – EnviRoss
Freshwater Impact Assessment – EnviRoss
Avifaunal Impact Assessment – Chris van Rooyen Consulting
Soil & Agricultural Impact Assessment – The Biodiversity Company
Heritage Impact Assessment – CTS Heritage
Social Impact Assessment - Savannah Environmental (peer review Tony Barbour)
Visual Impact Assessment – LOGIS and NuLeaf Planning & Environmental
Glint & Glare Analysis Report - PVinsight
Traffic Impact Assessment – iWink Consulting

Benefits of Renewable Energy Developments

- **New Business**: Some of the positive spin off effects that are to ensue from the project expenditure will be localised in the communities located near the site. The local services sector and specifically the trade, transportation, catering and accommodation, renting services, personal services and business services are expected to benefit the most from the project activities during the construction phase. New business sales that will be stimulated as a result of the establishment of the solar farm, albeit for a temporary period, will be lost with the implementation of the 'do nothing' alternative. Therefore, from a business perspective, the 'do-nothing' alternative is not preferred as there is a loss of new business opportunities.
- **Employment**: The development of Quantum 1 SEF within the Mogale City Local Municipality will aid in a reduction of the unemployment rate, however if the solar farm is not developed then the unemployment rate will not be positively influenced by the proposed development. The upliftment and socio-economic benefits for individuals within local communities would be forfeited with the implementation of the 'do nothing' alternative. Therefore, from an employment perspective, the 'do-nothing' alternative is not preferred as there is a perceived loss of employment opportunities.
- **Skills development**: The establishment of Quantum 1 SEF will offer numerous opportunities for skills transfer and development. This is relevant for both on-site activities and manufacturing activities. Various renewable energy facilities are proposed to be developed in the Gauteng Province, which means that the transfer of skills from foreign experts to the local engineers and construction workers will take place, similar to what has taken place where other renewable energy facilities have been constructed and operated within the Province. The skills training and transfer benefits for individuals within local communities would be forfeited with the implementation of the 'do-nothing' alternative.
- **Municipal goals**: The opportunity to contribute to the innovative energy sourcing methods as identified by the West Rand District Municipality as per a draft policy which sets out the criteria which will enable the evaluation of renewable energy generation infrastructure to be developed in a manner that will limit the potential negative impacts thereof will not be met should Quantum 1 SEF not be constructed with the implementation of the 'do-nothing' alternative. Foregoing the proposed development would not necessarily compromise the

development of renewable energy facilities in South Africa. However, the socio-economic benefits for local communities at this location and within the surrounding area would be forfeited. The area has experienced social challenges which has resulted in the need for socio-economic upliftment. The Social Impact Assessment (SIA) concluded that there would be greater social benefits associated with the project than the 'do nothing' alternative. Therefore, from a socio-economic perspective, the 'do-nothing' alternative is not preferred due to the loss of socio-economic benefits associated with the project when considering the current socio-economic conditions of the area.

» **Impact on electricity supply and targets regarding renewable energy**: At a broader scale, the benefits of additional capacity to the electricity grid and those associated with the introduction of renewable energy would not be realised. Although Quantum 1 SEF is only proposed to contribute a contracted capacity of up to 10MW to the grid capacity, this would assist in meeting the electricity demand for the relevant off-takers and would also assist in meeting the government's goal

» for renewable energy and the energy mix. The generation of electricity from renewable energy resources offers a range of potential socio-economic and environmental benefits for South Africa. These benefits include:

- Increased energy security;
- Resource saving (i.e. fossil fuels and water);
- Exploitation of South Africa's significant renewable energy resource;
- Pollution reduction;
- Climate friendly development;
- Support for international agreements;
- Employment creation;
- Acceptability to society; and
- Support to a new industry sector.

At present, South Africa is some way off from fully exploiting the diverse gains from renewable energy and from achieving a considerable market share in the renewable energy industry. South Africa's electricity supply remains heavily dominated by coal-based power generation, with the country's significant renewable energy potential largely untapped to date. The Integrated Resource Plan (IRP) (2019) provides for the development of 6 000MW of capacity from large scale solar energy facilities by 2030. The IRP essentially drives the assortment of energy to be implemented for South Africa which is known as the energy mix of the country, considering various generation technologies.

Describe any gaps in knowledge or assumptions made in the assessment of the environment and the impacts associated with the proposed development.

- This report was prepared based on information which was available at the time of preparing the report. The sources consulted are not exhaustive, and the possibility exists that additional information which might strengthen arguments, contradict information in this report, and / or identify additional information might exist.
- This study assumes that the sources of information used in this report are reliable.
- The conclusions and perceived impacts in the report are based on respective specialist studies. Specialist studies rely on desktop surveys which have been reiterated by ground-truthing and limited field surveys of the area encompassing the proposed development. Due to this, the species and community structures that are mentioned within the report allude to the assessment of overall ecological health and functionality of the survey area or for the purposes of rating the significance of the ecological impacts and to allow for the objective presentation of the significance of the ecological impacts and the level of practical mitigation. Species accounts therefore do not represent an absolute comprehensive account of the species that may occur within the scope of the project area.
- It should be noted that archaeological and paleontological deposits often occur below ground level. Should artefacts or skeletal material be revealed at the site during construction, such activities should be halted, and it would be required that the heritage consultants are notified for an investigation and evaluation of the find(s) to take place.

3. IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING AND CLOSURE PHASE

Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the decommissioning and closure phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

Proposal

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
Avifauna				
Displacement of priority species due to disturbance associated with decommissioning of the Quantum 1 SEF and associated infrastructure.	**Medium negative (55)**	» Activity should be restricted to the footprint of the infrastructure as far as possible. » Measures to control noise and dust should be applied according to current best practice in the industry.	**Medium negative (45)**	» Displacement of priority species due to disturbance associated with decommissioning of the PV plant and associated infrastructure. » The residual risk of displacement will be

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
		» Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. » Access to the rest of the property must be restricted. » The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint is concerned.		reduced but remain at a medium level after mitigation, if the proposed mitigation is implemented.
Traffic				
Increase in trips on external roads due to transport of components, material and labour to site. Noise/dust pollution during transport and construction activities on site.	**Medium negative (36)**	» Source equipment, machinery and material locally as far as possible. » Stagger deliveries of components to site and scheduled to occur outside of peak traffic periods as much as possible. » Dust suppression of gravel roads close to and on site. » Regular maintenance of gravel roads located within the site boundary, including the access road to the site. » The use of quarries near the site as much as possible.	**Low negative (20)**	» The decommissioning phase will generate traffic including transportation of people, construction materials, water, and equipment (abnormal trucks transporting the transformers). The exact number of trips generated will be determined at a later stage. Based on the high-level screening of impacts, a negative low impact rating can be expected during the decommissioning phase with mitigation measures

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
		» Staff trips to occur outside of main peak traffic periods as far as possible. » Delivery Management Plan		

Alternative 1

Potential impacts:	Significance rating of impacts(positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

Avifaunal Impact Assessment – Chris van Rooyen Consulting Traffic Impact Assessment – iWink Consulting

Where applicable indicate the detailed financial provisions for rehabilitation, closure and ongoing post decommissioning management for the negative environmental impacts.

4. CUMULATIVE IMPACTS

Describe potential impacts that, on their own may not be significant, but is significant when added to the impact of other activities or existing impacts in the environment. Substantiate response:

Cumulative impacts and benefits on various environmental and social receptors will occur to varying degrees with the development of several renewable energy facilities in South Africa. The degree of significance of these cumulative impacts is difficult to predict without detailed studies based on more comprehensive data/information on each of the receptors and the site-specific developments. The alignment of renewable energy developments with South Africa's National Energy Response Plan and the global drive to move away from the use of non-renewable energy resources and to reduce greenhouse gas emissions is undoubtedly positive. The economic benefits of renewable energy developments at a local, regional and national level have the potential to be significant.

4.1. Approach taken to Assess Cumulative Impacts

The cumulative impacts that have the potential to be compounded through the development of the PV facility and its associated infrastructure in proximity to other similar developments include impacts such as those listed below. The role of the cumulative assessment is to test if such impacts are relevant to the Quantum 1 SEF within the project site being considered for the development:

- Unacceptable loss of threatened or protected vegetation types, habitat or species through clearing, resulting in an impact on the conservation status of such flora, fauna or ecological functioning;
- Unacceptable risk to avifauna through habitat loss, displacement, collision and interaction with power infrastructure;
- Unacceptable loss of high agricultural potential areas presenting a risk to food security and increased soil erosion;
- Unacceptable loss of heritage resources;
- Complete or whole-scale change in sense of place and character of an area and unacceptable visual intrusion;
- Unacceptable impact to socio-economic factors and components; and

It is important to explore the potential for cumulative impacts as this will lead to a better understanding of these impacts and the potential for mitigation that may be required. The scale at which the cumulative impacts are assessed is important. For example, the significance of the cumulative impact on the regional or national economy will be influenced by solar energy facility developments throughout South Africa, while the significance of the cumulative impact on visual amenity may only be influenced by solar energy facility developments that are in closer proximity to each other. For practical purposes a sub-regional scale of 30km has been selected for this cumulative impact evaluation.

Figure 5 indicates the location of the Quantum 1 SEF in relation to all other known and viable PV facilities (i.e. projects with a valid Environmental Authorisation) located within a radius of 30km from the project

site. These projects were identified using the Department of Forestry, Fisheries and the Environment Renewable Energy Database and current knowledge of projects being proposed in the area. In the case of the Quantum 1 SEF, there are two (2) authorised PV facilities and one (1) newly proposed PV facility located within a 30km radius of the project site (refer to **Figure 5** and **Table 2**). The potential for cumulative impacts is summarised in the sections that follow and has been considered within the specialist studies (refer to **Appendices G1-G9**).

Table 2: PV facilities located within the broader area (within a 30km radius) of the Quantum 1 SEF

Project Name	Reference Number(s)	Approximate distance from the Quantum 1 SEF	Project Status
PV Power Plant on Portion 57 of the Farm Waterval 174 (70MW)	12/12/20/2539	~ 3.7km south east	Environmental Authorisation issued
PV Power Plant on Portion 3 of the Farm Rietpoort 395 (15MW)	12/12/20/2330	~ 21.4km north west	Environmental Authorisation issued
Farm Brickvale 161 Solar Power Plant (19.9MW)	14/12/16/3/3/1/636	~ 3.5km south east	Environmental Authorisation in process

It should be noted that not all the PV facilities presently under consideration by various solar energy developers will be built for operation. Not all proposed developments will be granted the relevant permits by the relevant authorities (DFFE or Provincial Environmental Authority, DMRE, NERSA and Eskom) due to the following reasons:

- Not all proposed PV facilities will be able to reduce the associated negative impacts to acceptable levels or be able to mitigate the impacts to acceptable levels (fatally flawed);
- Not all applications will receive a positive environmental authorisation;
- There may be limitations to the capacity of the existing or future Eskom grid;
- There are stringent requirements to be met by applicants in terms of the REIPPP Programme and other private offtake programmes, which are all highly competitive processes that only select the most competitive projects;
- Not all proposed facilities will eventually be granted a generation license by NERSA and sign a Power Purchase Agreement with Eskom; and
- Not all developers will be successful in securing financial support to advance their projects further.

As there is therefore a level of uncertainty as to whether all the above-mentioned PV facilities will be implemented, this results in it being difficult to quantitatively assess the potential cumulative impacts. The cumulative impacts of other known PV facilities in the broader area and the Quantum 1 SEF are therefore qualitatively assessed in this Chapter. The following potential impacts are considered:

- Cumulative Impacts on Terrestrial Biodiversity
- Cumulative Impacts on Freshwater Biodiversity
- Cumulative Impacts on Avifauna
- Cumulative Impacts on Heritage Resources
- Cumulative Visual Impacts
- Cumulative Socio-economic Impacts
- Cumulative Impacts on Traffic

4.2. Summary of Cumulative Impacts Assessed

Quantum 1 SEF will contribute to the cumulative impact experienced within the area. The cumulative impacts associated with the facility have been assessed to be acceptable, with no unacceptable loss or risk expected (refer to **Appendices G1-G9**).

Table 3: Summary of the cumulative impact significance for the Quantum 1 SEF

Specialist assessment	Overall significance of impact of the proposed project considered in isolation	Cumulative significance of impact of the project and other projects in the area
Terrestrial Ecology	Low	Low
Freshwater Ecology	Low	Low
Avifauna	Low	Moderate
Heritage (including archaeology, palaeontology and sense of place)	Moderate	Moderate
Visual	Moderate	Moderate
Socio-Economic	Positive impacts: Moderate Negative impacts: Moderate	Positive impacts: Moderate Negative impacts: Moderate
Traffic	Moderate	Moderate

Based on the specialist cumulative assessment and findings, the development of Quantum 1 SEF and its contribution to the overall impact of all renewable energy projects to be developed within a 30km radius, it can be concluded that the Quantum 1 SEF cumulative impacts will be of mostly low to moderate significance. Based on all areas of study considered as part of this BA report, the development of Quantum 1 SEF will not result in unacceptable cumulative impacts and will not result in a whole-scale change of the environment.

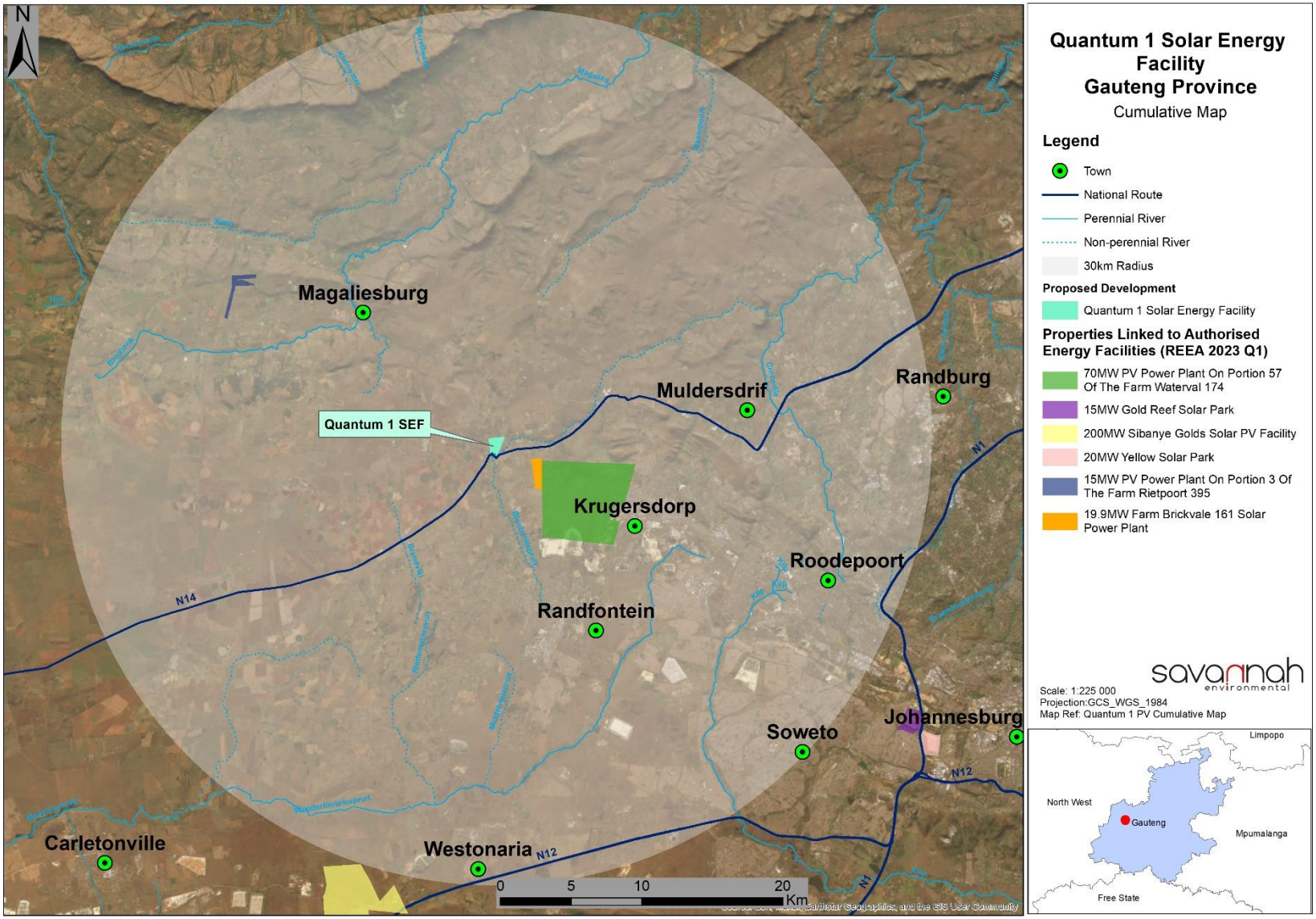

Figure 5: Identified PV facility projects located within a 30km radius of the Quantum 1 SEF that are considered as part of the cumulative impact assessment for the Quantum 1 SEF.

5. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that sums up the impact that the proposal and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Proposal

The preferred activity was determined by the developer to be the development of a renewable energy facility on site using solar PV as the preferred technology, due to the availability of a strong solar resource, available grid connection, benign topography and good site access, amongst others. A technically viable development footprint was proposed by the developer considering environmental sensitivities identified and assessed as part of the BA process. The assessment of the development footprint within the project site was undertaken by independent specialists and their findings have informed the results of this BA Report.

From a review of the relevant policy and planning framework, it was concluded that the project is well aligned with the policy framework, and a clear need for the project is seen from a policy perspective at a local, provincial and National level.

The specialist findings from the BA process have indicated that there are no identified fatal flaws associated with the implementation of the development footprint within the project site subject to implementation of the recommended mitigation measures. Specialist studies have concluded that the proposed layout for the PV facility and associated infrastructure, as proposed is acceptable within the development area, and can be authorised on condition that the recommended mitigation measures are implemented.

Impacts can be mitigated to acceptable levels or enhanced through the implementation of the recommended mitigation or enhancement measures. The layout assessed within this BA Report is therefore considered to be acceptable for implementation and should be authorised.

The benefits of Quantum 1 SEF are expected to occur at a national, regional and local level. As the costs to the environment at a site-specific level can be appropriately managed and minimised as detailed in this report, the benefits of the project are expected to partially offset the localised environmental costs of the solar facility.

From a social perspective, both positive and negative impacts are expected. The implementation of the 'do-nothing' alternative will result in a number of lost opportunities. The 'do nothing' alternative is therefore not preferred and not proposed to be implemented for the development of Quantum 1 SEF.

Through the assessment of the development footprint within the project site, it can be concluded that the development of Quantum 1 SEF will not result in unacceptable environmental impacts (subject to the implementation of the recommended mitigation measures).

Alternative 1

[redacted]

Alternative 2

[redacted]

No-go (compulsory)

The 'do-nothing' alternative is the option of not constructing and operating the Quantum SEF. Should this alternative be selected, there would be no environmental impacts or benefits as a result of construction and operation activities associated with a Solar Energy Facility. The 'do-nothing' alternative will therefore likely result in minimising the cumulative impact on the land. All baseline information provided in this report relates to the current situation on site and in the surrounding area and can be considered the do nothing alternative. Impacts are limited to the status quo. All negative impacts, specifically related to the development of the SEF, discussed in this report will not materialise. In addition, positive impacts identified to be associated with the project will be foregone.

As detailed in this report, no fatal flaws were identified to be associated with the development of the project, and all specialists concluded that the project can proceed with the implementation of the recommended mitigation measures. The opportunities presented by the development will be lost if the no-go alternative is applied and is therefore not considered desirable. The negative impacts of the no-go alternative are considered to outweigh the positive impacts of this alternative.

6. IMPACT SUMMARY OF THE PROPOSAL OR PREFERRED ALTERNATIVE

For proposal:

The preceding sections of this report, together with the specialist studies contained within **Appendices G1-G9** provide a detailed assessment of the potential impacts that may result from the development of Quantum 1 SEF.

No environmental fatal flaws or unacceptable impacts were identified in the detailed specialist studies conducted, provided that the recommended mitigation measures are implemented.

The potential environmental impacts associated with Quantum 1 SEF assessed through the BAR process include:

- Impacts on terrestrial ecology (flora and fauna)
- Impacts on freshwater ecology.
- Impacts on avifauna.
- Impacts on soils and agricultural potential.
- Impacts on heritage resources, including archaeology, palaeontology and the cultural landscape.
- Visual impacts on the area imposed by the components of the facility.
- Positive and negative social impacts.

» Traffic impacts on the area.

Impacts are expected during both the construction and operation phases of the project, and are expected to be of low to medium significance with the implementation of mitigation measures. Some sensitive environmental features have been identified to be associated with the project site. These are avoided by the proposed project layout, as shown in the map below.

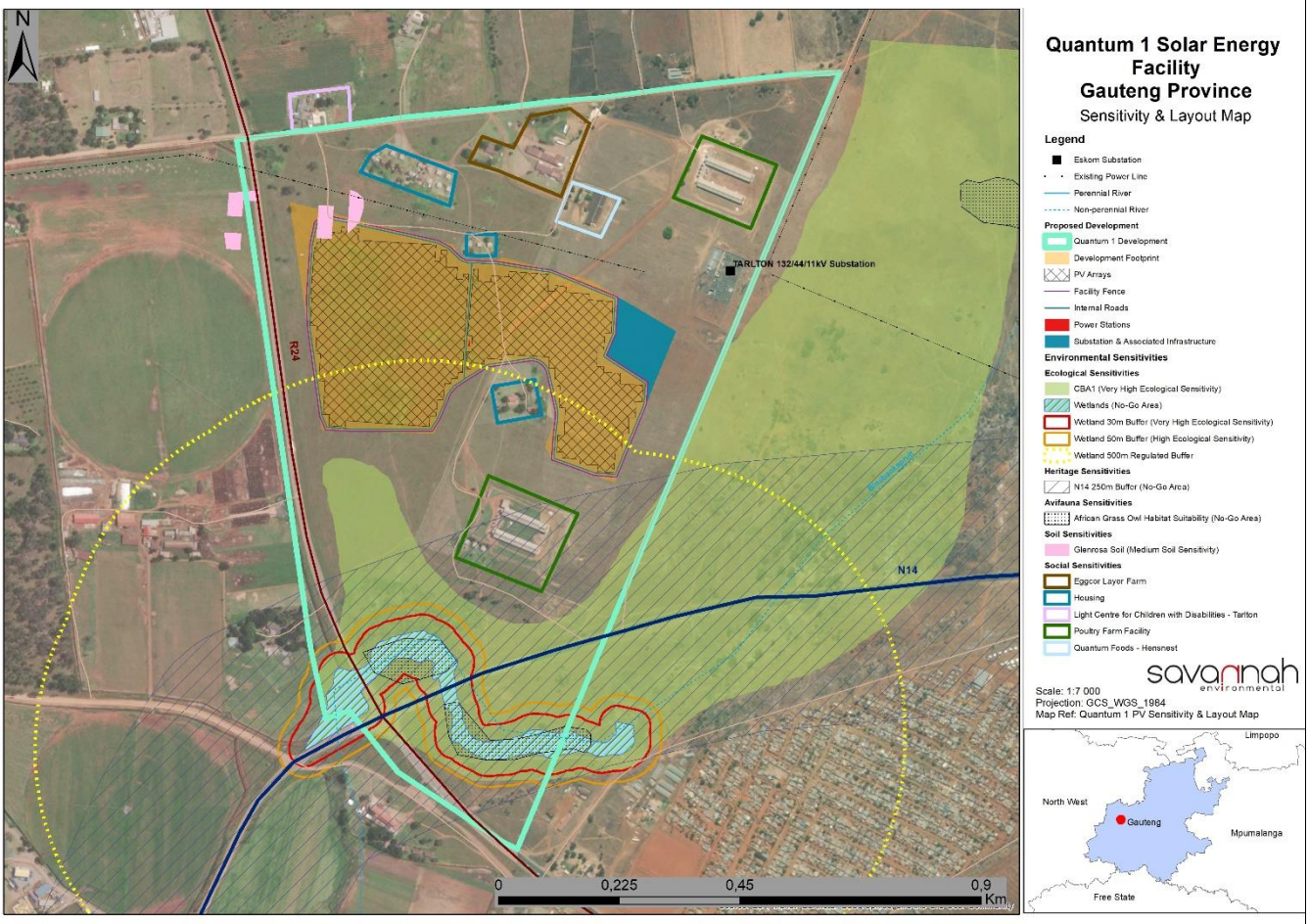

Figure 6: Environmental Sensitivity Map from the results of the scoping evaluation for the Quantum 1 SEF and associated infrastructure. The sensitivity map indicates the sensitivities for the project site, as well as the Quantum 1 SEF development area (indicated with the turquoise outline).

For alternative:

[redacted]

Having assessed the significance of impacts of the proposal and alternative(s), please provide an overall summary and reasons for selecting the proposal or preferred alternative.

The following provides a summary of the conclusions of the specialist studies undertaken:

» It is the opinion of the ecological specialist that the proposed development of the Quantum 1 Solar Energy Facility and associated infrastructure (in the locality and spatial extent as indicated at the

time of the assessment) can be favourably considered for authorisation as the survey results indicated that it would not impose any significant impacts to the terrestrial habitats and the ecological processes associated with them provided that the recommended mitigation measures are adhered to.

- » It is the opinion of the freshwater specialist that the proposed development of the Quantum 1 Solar Energy Facility and associated infrastructure (in the locality and spatial extent as indicated at the time of the assessment) can be favourably considered for authorisation as the survey results indicated that it would not impose any significant impacts to the surface water ecosystems within the area provided that the recommended mitigation measures are adhered to.
- » The proposed 10 MW Quantum 1 SEF will have anticipated high, medium, and low negative impacts on priority avifauna, which is expected to be reduced to medium and low with appropriate mitigation. No fatal flaws were discovered during the on-site investigations. The development is supported provided the mitigation measures listed in the avifauna report are strictly implemented.
- » Even though the broader area is rich in history, no significant archaeological heritage resources were identified during the field assessment. No Stone Age or Iron Age heritage resources of significance were identified during the survey. In addition, no structures of cultural value or graves were identified. As such, this development is not considered to be a sensitive archaeological landscape. On condition that the recommendations outlined in the HIA are implemented, there is no objection to the proposed development from a heritage perspective.
- » Overall, the significance of the visual impacts is expected to range from moderate to low, as a result of the existing visual clutter and urban development surrounding the site. A number of mitigation measures have been proposed in the VIA. If mitigation is undertaken as recommended, it is concluded that the significance of most of the anticipated visual impacts will remain at or be managed to acceptable levels. As such, the Quantum 1 SEF was considered to be acceptable from a visual impact perspective and was recommended for authorization by the respective specialist.
- » The proposed Quantum 1 Solar Energy Facility and associated infrastructure is unlikely to result in permanent damaging social impacts. The Quantum 1 Solar Energy Facility has the potential to result in significant positive cumulative impacts, specifically with regards to the creation of several socio-economic opportunities for the region, which in turn, can result in positive social benefits. From a social perspective, it was concluded that the proposed project and associated infrastructure is acceptable and should be developed subject to the implementation of the recommended mitigation measures and management actions contained in the SIA report
- » The construction and decommissioning phases of a solar power facility are the only significant traffic generators and therefore noise and dust pollution will be higher during these phases. The duration of these phases is of temporary nature, i.e., the impact of the solar power facility on the external traffic on the surrounding road network is temporary and solar facilities, when operational, do not add any significant traffic to the road network. The proposed development of the Quantum 1 SEF Energy Facility is supported from a traffic engineering perspective provided that the recommended mitigation measures are adhere to.
- » Considering the low sensitivities associated with land potential resources, it is the specialist's opinion that the proposed activities will have an acceptable impact on soil resources and that the proposed activities may proceed as have been planned as no loss of land capability is evident. It is also expected that no segregation of high production agricultural resources will occur.

Based on the specialist studies undertaken for the project, no fatal flaws were identified to be associated with the development of the project, and all specialists concluded that the project can proceed with

the implementation of the recommended mitigation measures. The opportunities presented by the development will be lost if the no-go alternative is applied and this alternative is therefore not considered desirable. The negative impacts of the no-go alternative are considered to outweigh the positive impacts of this alternative. Therefore, the proposal (i.e. Quantum 1 SEF) is the preferred alternative for implementation.

Considering the findings of the independent specialist studies, the impacts identified, the development footprint proposed by the developer and the potential to minimise the impacts to acceptable levels through mitigation, it is the reasoned opinion of the EAP that Quantum 1 SEF is acceptable within the landscape and can reasonably be authorised subject to implementation of mitigation and enhancement measures recommended by the specialists.

7. SPATIAL DEVELOPMENT TOOLS

Indicate the application of any spatial development tool protocols on the proposed development and the outcome thereof.

The Applicant has commenced with the rezoning application for the site from "Agriculture" to "Agriculture with and annexure for Industrial Use" for our proposed SEF development. Mogale City has confirmed that they conditionally support the rezoning application (refer to **Appendix I**).

8. RECOMMENDATION OF THE PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the Environmental Assessment Practitioner as bound by professional ethical standards and the code of conduct of EAPASA).	YES [redacted]

If "NO", indicate the aspects that require further assessment before a decision can be made (list the aspects that require further assessment):

[redacted]

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

The following conditions should be included within an EA for the project:

- All mitigation measures detailed within this BA Report, as well as the specialist reports contained within **Appendices G1-G9** must be implemented.
- The EMPrs (for the facility and onsite substation) as contained within **Appendix H** of this BA Report should form part of the contract with the Contractors appointed to construct and maintain the solar facility in order to ensure compliance with environmental specifications and management measures. The implementation of this EMPr for all life cycle phases of Quantum 1 SEF is considered key in achieving the appropriate environmental management standards as detailed for this project.

- The layout presented within this report (**Figure 6**) should be authorised for implementation. No development is permitted within the identified no-go areas as detailed in this report and the specialist reports contained in **Appendices G1-G9**.
- A 250m no development buffer should be implemented along the N14. The layout provided complies with this requirement.
- Specific engagement with the MA for the COHWHS should take place regarding development within the identified WHS buffer.
- The Chance Fossil Finds Procedure must be implemented for all excavation activities.
- The African Grass Owl habitat buffers as indicated in the Avifaunal report should be maintained.
- A 30m buffer around watercourses must be maintained.
- A pre-construction walk-through of the final layout, including roads and underground cables, should be undertaken to inform permit applications for species of conservation concern. Permits from the relevant provincial authorities, will be required to relocate and/or disturb listed plant and/or animal species.
- All other relevant environmental permits must be obtained prior to the construction of the facility.
- No indigenous vegetation may be cleared outside of the direct project footprint.
- Erosion control measures and avoidance of indiscriminate habitat destruction outside of the ultimate construction footprint are regarded as the most pertinent mitigation measures.
- It is recommended that the developer manage the riparian zones of the watercourse for exotic vegetation and the currently unabated dumping of rubble that takes place within that area.
- Compile and implement an alien vegetation management plan from the onset of construction. The plan must identify areas for action (if any) and prescribe the necessary removal methods and frequencies to be applied. This plan must be also prescribing a monitoring plan and be updated as/when new data is collated;
- Implement a waste management plan. This plan must be also prescribing a monitoring plan and be updated as/when new data is collated. Waste management must be a priority and all waste must be collected, stored and disposed of adequately. It is recommended that all waste be removed from site on a weekly basis (as a minimum) to prevent rodents and pests entering the site.

9. THE NEED AND DESIRABILITY OF THE PROJECT (as per notice 792 of 2012, or the updated version of this guideline)

The Quantum 1 SEF is proposed in response to the identified objectives of the national and provincial government and local and district municipalities to develop renewable energy facilities for power generation purposes. The following key plans have been developed by National Government to consider South Africa's current energy production, projected future demands, and provides the necessary framework within which energy generation projects can be developed:

- Integrated Energy Plan (IEP)
- Integrated Resource Plan (IRP)

The above-mentioned energy plans have been extensively researched and are updated on an on-going basis to take into consideration changing scenarios, new information, developments in new technologies, and to reflect updated demands and requirements for energy production within the South African context. These plans form the basis of South Africa's energy generation sector and dictate national priorities for energy production.

It is the developer's intention to submit a bid in terms of a regulated power purchase procurement process (e.g., REIPPPP) with the aim of evacuating the generated power into the national grid or obtaining a commercial PPA (Power Purchase Agreement). This will aid in the diversification and stabilisation of the country's electricity supply, in line with the objectives of the Integrated Resource Plan (IRP) with the Quantum 1 SEF set to inject up to 10MW (peak AC power) into the national grid.

From a regional perspective, the area within the West Rand District Municipality identified for the project is considered favourable for the development of a commercial PV facility due to the low environmental sensitivity of the identified site, excellent solar resource, and availability of land on which the development can take place. There is also potential for evacuating the power to the national grid via a direct grid connection at the Eskom Tarlton 132/44/11kV substation which is adjacent to the proposed site. The site is also in proximity to large electricity users which opens opportunities for commercial PPAs (Behind the meter connection Or Wheeling to a 3rd party off-taker).

As detailed in this report, the placement of a Solar Energy Facility is strongly dependent on several factors including climatic conditions (solar irradiation), topography, the location of the site, availability of grid connection, the extent of the site and the need and desirability for the project. From a local level perspective, the project site and development area have specifically been identified by the proponent as being highly desirable from a technical perspective for the development of a PV facility.

The development area within which the facility footprint is proposed is sufficient in extent for the installation of a solar PV facility with a development footprint of ~19.99ha, while allowing for the avoidance of environmental site sensitivities. This consideration is in line with the mitigation strategy and enables the achievement of the objectives of the mitigation hierarchy (i.e., avoid, minimise, mitigate). The layout proposed for the facility avoids areas if sensitivity identified through this BA process and therefore achieves the first level of the mitigation hierarchy. Where impacts were identified to still occur, mitigation measures have been proposed which will reduce these impacts to acceptable levels. The project is therefore considered to be acceptable within the landscape and can reasonably be authorised subject to implementation of mitigation and enhancement measures recommended by the specialists.

10. THE PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED *(CONSIDER WHEN THE ACTIVITY IS EXPECTED TO BE CONCLUDED)*

A validity period of 10 years of the Environmental Authorisation is requested, should the project obtain approval from GDARD

11. ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) (must include post construction monitoring requirements and when these will be concluded.)

If the EAP answers "Yes" to Point 7 above then an EMP is to be attached to this report as an Appendix

EMPr attached	YES

SECTION F APPENDICES

The following appendixes must be attached as appropriate (this list is inclusive, but not exhaustive):

It is required that if more than one item is enclosed that a table of contents is included in the appendix

Appendix A: Site plan(s) – *(must include a scaled layout plan of the proposed activities overlain on the site sensitivities indicating areas to be avoided including buffers)*

Appendix B: Photographs

Appendix C: Facility illustration(s)

~~Appendix D: Route position information~~

Appendix E: Public participation information

~~Appendix F: Water use license(s) authorisation, SAHRA information, service letters from municipalities, water supply information~~

Appendix G: Specialist reports
- Appendix G1: Terrestrial Biodiversity Impact Assessment
- Appendix G2: Surface Water Ecosystems Impact Assessment
- Appendix G3: Avifaunal Impact Assessment
- Appendix G4: Soil and Agricultural Impact Assessment
- Appendix G5: Heritage Impact Assessment
- Appendix G6: Social Impact Assessment
- Appendix G7: Visual Impact Assessment
- Appendix G8: Glint and Glare Analysis Report
- Appendix G9: Traffic Impact Assessment

Appendix H: EMPr

Appendix I: Other information
- Appendix I: Environmental Assessment Practitioner CVs
- Appendix I: EAP Declaration
- Appendix I: Communication with MCLM - Rezoning

CHECKLIST

To ensure that all information that the Department needs to be able to process this application, please check that:

- Where requested, supporting documentation has been attached;
- All relevant sections of the form have been completed.