

ENVIRONMENTAL IMPACT ASSESSMENT
PROCESS
DRAFT BASIC ASSESSMENT REPORT

**PROPOSED TOITDALE SOLAR ENERGY
FACILITY, NORTHERN CAPE**

DEA Ref No: 12/12/20/2653

**DRAFT FOR PUBLIC REVIEW
03 January 2012 - 01 February 2012**

Prepared for:

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environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

(For official use only)

File Reference Number:

Application Number:

Date Received:

Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2010, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2010 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. 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.
3. Where applicable **tick** the boxes that are applicable in the report.
4. An incomplete report may be returned to the applicant for revision.
5. 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 rejection of the application as provided for in the regulations.
6. This report must be handed in at offices of the relevant competent authority as determined by each authority.
7. No faxed or e-mailed reports will be accepted.
8. The report must be compiled by an independent environmental assessment practitioner.
9. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
10. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.

PROJECT DETAILS

DEA Reference No.	: 12/12/20/2653
Title	: Environmental Basic Assessment Process Draft Basic Assessment Report: Proposed establishment of the Toitdale Solar Energy Facility near Noupoot, Northern Cape
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When used as a reference this report should be cited as: Savannah Environmental (2012) Draft Basic Assessment Report: Proposed establishment of the Toitdale Solar Energy Facility near Noupoot, Northern Cape.

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SUMMARY AND OVERVIEW OF THE PROPOSED PROJECT CHAPTER 1

Toitdale Solar Energy is proposing the establishment of solar energy facility for electricity generation of up to 10 MW in capacity. The facility is proposed on Portion 1 of the Farm Toitdale 167, approximately 4 km north-west of Noupoort in the Northern Cape (refer to Figure 1).

The purpose of the proposed facility is to sell the electricity to Eskom as part of the Renewable Energy Independent Power Producers (IPP) Procurement Programme. The IPP Procurement Programme has been introduced by the Department of Energy (DoE) to promote the development of renewable power generation facilities by IPPs. Selling of electricity according to the IPP Procurement Programme has the advantage of giving developers long-term stability and predictability.

The facility is expected to require an area of less than 20 ha within which the following infrastructure will be established (refer to Figure 2).

- » Concentrating Photovoltaic (CPV) panels with a generation capacity of 10 MW.
- » Dedicated invertors to convert the electricity from direct to alternating current as well as on-site transformers and switchgear.
- » Underground cabling between the CPV panels, the transformers, the switch gear and Eskom's existing Newgate Substation.
- » Internal access roads may be required
- » Laydown areas and a workshop may be required.

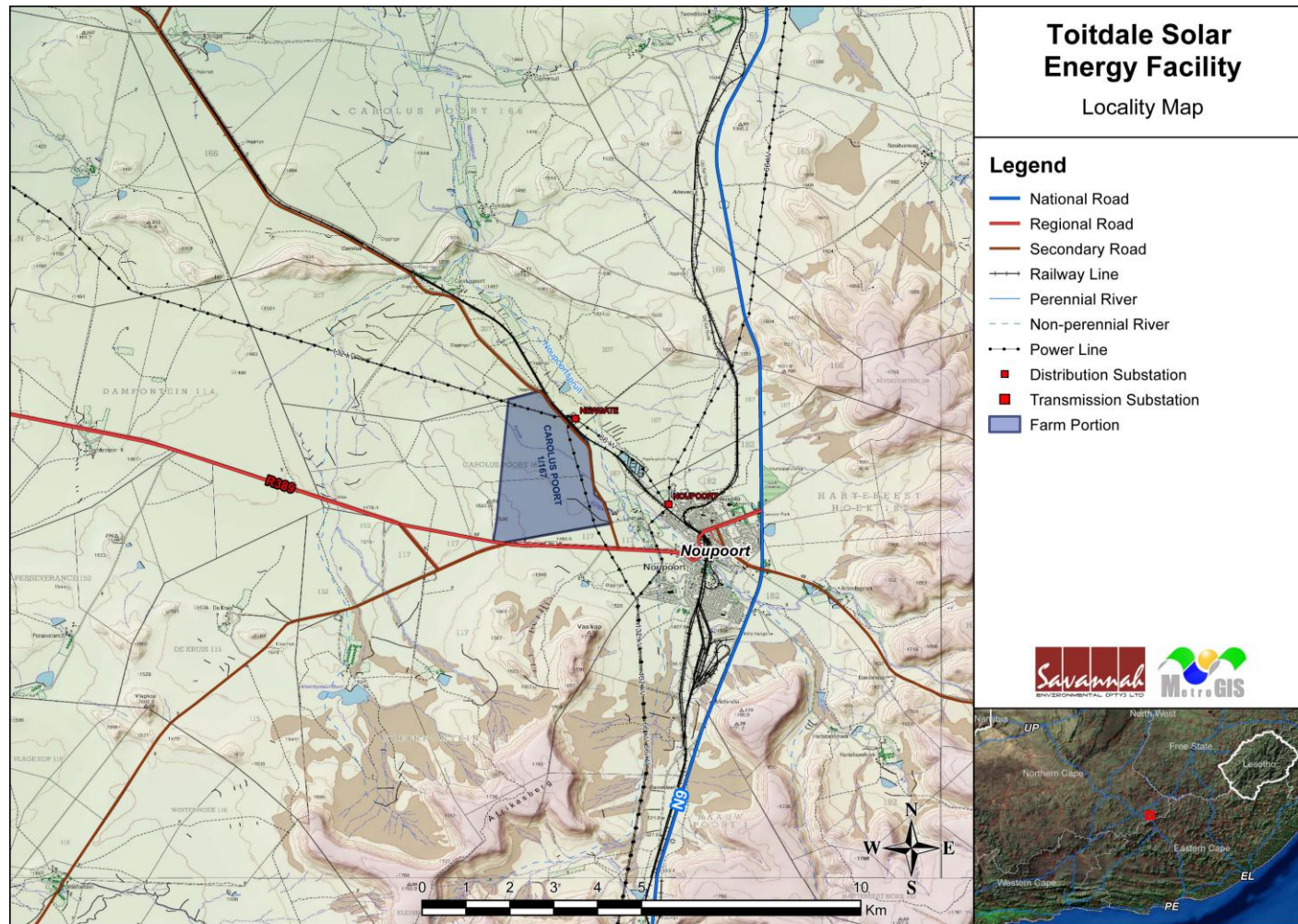


Figure 1: Locality map showing the proposed project development area

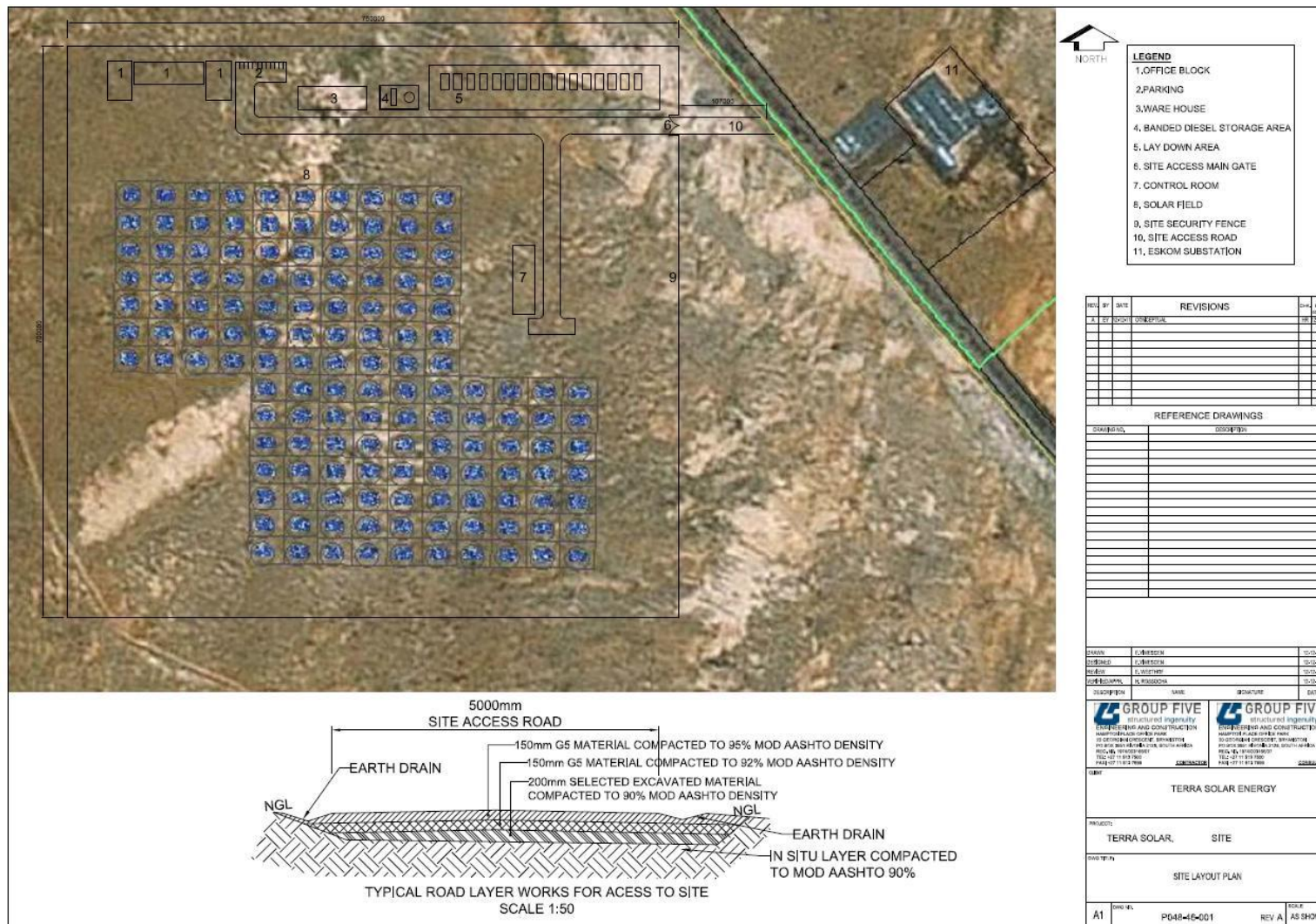


Figure 2: Map showing the layout of the proposed facility

1.1. Rationale for the Development of the Proposed Facility

There is increasing pressure globally to increase the share of renewable energy generation due to the exploitation of and large scale reliance on non-renewable resources, and the potential subsequent impacts on climate. South Africa currently depends on fossil fuels for the supply of approximately 90% of its primary energy needs. With economic development over the next several decades resulting in an ever increasing demand for energy, there is some uncertainty as to the availability of economically extractable coal reserves for future use. Furthermore, several of South Africa's power stations are nearing the end of their economic life which is coupled with the expense of the recommissioning of older power stations (i.e. Camden, Komati, and Grootvlei which is expected to cost in the region of R20 billion to return on line).

The current electricity imbalances in South Africa highlight the significant role that renewable energy can play in terms of power supplementation. Given that renewables can generally be deployed in a decentralised manner close to consumers, they offer the opportunity for improving grid strength and supply quality, while reducing expensive transmission and distribution losses. At present, South Africa is some way off from exploiting the diverse gains from renewable energy and from achieving a considerable market share in the industry. In order to meet the long-term goal of a sustainable renewable energy industry, a target of 17.8 GW of renewables by 2030 has been set by the Department of Energy (DoE) within the Integrated Resource Plan (IRP) 2010 and incorporated in the IPP Procurement Programme. This energy will be produced from various renewable energy technologies including solar energy facilities (i.e. such as CPV technology).

1.2. Requirement for an Environmental Impact Assessment Process

In terms of the EIA Regulations published in terms of Section 24(5) of the National Environmental Management Act (NEMA, Act No. 107 of 1998), authorisation is required from the National Department of Environmental Affairs (DEA) as the competent authority, in consultation with the Northern Cape Department of Environment and Nature Conservation (DENC), for the establishment of the proposed solar energy facility. In terms of sections 24 and 24D of NEMA, as read with the EIA Regulations of GN R543 – R546, a Basic Assessment process is required to be undertaken for the proposed project. The project has been registered with the National Department of Environmental Affairs as the competent authority under application reference number 12/12/20/2653.

Relevant Notice	Activity Number	Description of the Listed Activity	Relevance
GN 544, 18 June 2010	1	The construction of facilities or infrastructure for the generation of electricity where: i. The electricity output is more than 10 MW but less than 20 MW; or ii. The output is 10 megawatts or less but the total extent of the facility covers an area in excess of 1 ha.	The proposed facility will have a generation capacity of ~ 10 MW and will be constructed over an area larger than 1 ha.
GN 544, 18 June 2010	10	The construction of facilities or infrastructure for the transmission and distribution of electricity: i. Outside urban areas or industrial complexes with a capacity of more than 33 kV but less than 275 kV; or ii. Inside urban areas or industrial complexes with a capacity of 275 kV or more.	The facility will require the construction of an underground distribution power line, connecting to the Newgate Substation.
GN 544, 18 June 2010	23	The transformation of undeveloped, vacant or derelict land to: i. Residential, retails, commercial, recreational, industrial, or institutional use, inside an urban area, and where the total area to be transformed is 5 ha or more but less than 20 ha, or; ii. Residential, retails, commercial, recreational, industrial, or institutional use, outside an urban area, and where the total area to be transformed is bigger than 1 ha but less than 20 ha.	The proposed project development site is outside an urban area and is currently undeveloped. The land will be transformed to industrial use over an area of less than 20 ha. The developer is proposing to use the special rezoning applicable to renewable energy facilities as proposed by government.
GN 546, 18	10(ii)	The construction of facilities	Fuel to be used during

June 2010		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 m ³ .	construction may need to be stored on-site. The volumes need to be confirmed however these will be stored in temporary storage areas.
GN 546, 18 June 2010	13(c)ii	The clearance of an area of 1 ha or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation.	An area of 1 ha or more of indigenous vegetation cover may need to be cleared. .

1.3. Details of the Environmental Assessment Practitioner

Savannah Environmental was contracted by Toitdale Solar Energy as the independent environmental assessment practitioners (EAP) to undertake the Basic Assessment process for the proposed solar energy facility. Neither Savannah Environmental, nor any of its specialist sub-consultants on this project are subsidiaries of, or are affiliated to Toitdale Solar Energy. Furthermore, Savannah Environmental does not have any interests in secondary developments that may arise out of the authorisation of the proposed project.

Savannah Environmental is a specialist environmental consultancy which provides a holistic environmental management service, including environmental assessment and planning to ensure compliance with relevant environmental legislation. Savannah Environmental benefits from the pooled resources, diverse skills and experience in the environmental field held by its team that has been actively involved in undertaking environmental studies for a wide variety of projects throughout South Africa and neighbouring countries. Strong competencies have been developed in project management of environmental processes, as well as strategic environmental assessment and compliance advice, and the assessment of environmental impacts, the identification of environmental management solutions and mitigation/risk minimising measures.

The proposed project team members from Savannah Environmental include:

- » *Karen Jodas* who will be the project manager responsible for planning, programming, and overseeing of the EIA process. Karen has 15 years experience in conducting EIAs and in EIA project management.
- » *Tammy Kruger* who will be the EAP responsible for preparation of the EIA reports and assessment of environmental aspects. Tammy has 5 years experience in the environmental field and has been involved with the EIA Process for multiple solar energy facilities, particularly in the Northern Cape.

Savannah Environmental has gained extensive knowledge and experience on potential environmental impacts associated with electricity generation projects through their involvement in related EIA processes. Savannah Environmental has completed the EIA process and received environmental authorisations for the numerous solar energy facilities.

In order to adequately identify and assess potential environmental impacts, several specialist sub consultants have been appointed to conduct specialist studies, as required.

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section? NO ✓

If YES, please complete the form entitled "Details of specialist and declaration of interest for appointment of a specialist for each specialist thus appointed:
Any specialist reports must be contained in Appendix D.

1. ACTIVITY DESCRIPTION

Describe the activity, which is being applied for, in detail¹:

Toitdale Solar Energy is proposing the establishment of a concentrating photovoltaic solar energy facility with a generation capacity of 10 MW to be established over an area of ~ 19 ha on a site located ~ 4 km north-west of Noupoot in the Northern Cape.

The facility will use the light energy from the sun to generate electricity through a process known as the *Photovoltaic Effect*.

The proposed facility will utilise Concentrating Photovoltaic (CPV) technology. The light energy from the sun is concentrated through Fresnel lenses onto the individual PV cells. This serves to increase the efficiency of the PV panels (i.e. up to 29% efficiency), as compared to conventional PV technology (i.e. 8 % – 18% efficiency) (refer to Figure 3). An inverter is used to convert the electricity which is produced as direct current into alternating current for the purpose of grid connection. A single solar generator produces 66kV which can power several houses, however to produce 10 MW, the proposed facility will require numerous solar generators arranged in multiples/arrays. The CPV Mega Modules will be elevated 2m above ground level by a support structure, and will be able to track the path of the sun during the day, thereby increasing the efficiency of the panels (refer to Figure 4).

For this type of technology approximately 1.8 ha is required per installed MW. Therefore, a 10 MW capacity facility requires a project development site of < 20 ha (i.e. the area also allows for the placement of the ancillary infrastructure such as the substation and workshop/maintenance building).

Each panel will be approximately 22 m wide and 12.5 m high. As such when the tracking panel is vertically the structure will be a maximum height of approximately 15 m.

¹ Please note that this description should not be a verbatim repetition of the listed activity as contained in the relevant Government Notice, but should be a brief description of activities to be undertaken as per the project description.

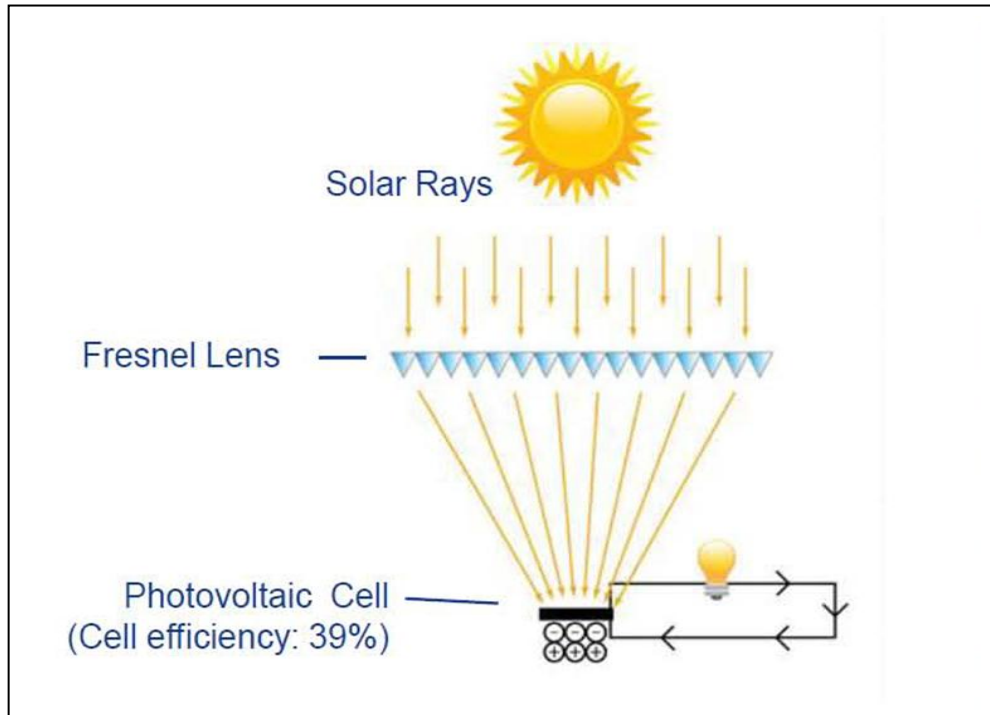


Figure 3: The efficiency of the PV panels is increased through the use of Fresnel Lenses which concentrated the amount of light entering the PV cells (Courtesy of Amonix™)



Figure 4: The support structures elevate the panels by 15 m and allow for dual axis tracking of the sun for increased efficiency (Courtesy of Amonix™)

In order to construct the proposed solar energy facility and its associated infrastructure, a series of activities will need to be undertaken during the design, pre-construction, construction, operation, and decommissioning phases which are discussed in more detail below.

2.1.1. Construction Phase

The facility is proposed to have a maximum installed capacity of 10 MW. Approximately 50 people are expected to be required during the construction phase which is expected to take place over a period of 6 months) of which 30% is estimated to be low skilled/semi-skilled positions, and 70% skilled. Low/semi-skilled positions will ideally be filled by locals living in and around Noupoort and potentially from places further afield such as Hanover, Colesberg, and Steynsberg. Workers not living in the area, including those for skilled positions, will not be housed on site.

The following construction activities are expected to form part of the project's scope of works.

Activity	Description
Pre-construction surveys	<p>Prior to initiating construction, a number of detailed surveys will be required including, but not limited to:</p> <ul style="list-style-type: none"> » <i>Geotechnical survey</i> – a geotechnical survey will be required in order to detail the geology and topography of the study area. The geotechnical study will also consider flood potential, foundation conditions, and the potential for excavations. This study will serve to inform the Engineering, Procurement, and Construction (EPC) Contractors regarding soil conditions, required to specify foundations required for the support structures, and the extent of earthworks and compaction required in the establishment of any internal access roads. » <i>Site survey</i> – this will be required to finalise the design layout of the CPV solar field and other associated infrastructure. The finalisation will need to be confirmed in line with the Environmental Authorisation issued for the facility.
Establishment of access roads	<ul style="list-style-type: none"> » The project development site is accessible from the R389 from Noupoort and subsequently via a secondary road which passes the Newgate Substation and continues to intersect with the N1. » Temporary access roads may be required during the construction phase; however these are likely to be single track gravel roads of less than 4 m wide.
Undertake site preparation	<ul style="list-style-type: none"> » Site preparation activities will include clearance of vegetation at the footprint of the following

	<p>infrastructure within the development footprint:</p> <ul style="list-style-type: none"> * Support structure/pedestals for the CPV panels (1 m² for each unit), with a total of 148 units. * Switchgear * Transformers (i.e. one for every 10 – 15 CPV units). * Workshop * Trenches for the underground cabling. <p>These activities may require the stripping of topsoil which will need to be stockpiled, backfilled and/or spread on site.</p>
<p>Transport of components and equipment to site</p>	<ul style="list-style-type: none"> » The components will be transported to site (in sections and components), likely from the Grahamstown area along the N10. » The following civil engineering construction equipment will be required on site (e.g. excavators, trucks, ready mix cement trucks, etc.) as well as components required for the establishment of the switchgear.
<p>Establishment of a construction camps and laydown areas</p>	<ul style="list-style-type: none"> » Once the required construction equipment has been transported to site, a dedicated equipment camp and laydown areas may be required. These will serve to confine activities and storage of equipment and/or fuel to designated area(s) to limit the potential ecological impacts associated with this phase of the project. » Fuel required for the on-site construction vehicles and the generator will need to be secured in a temporary bunded area within the construction camp(s) to prevent leakages and soil contamination. » Electricity required during the construction phase will be supplied via a generator.
<p>Establishment of the CPV panels (refer to Figure 4)</p>	<ul style="list-style-type: none"> » A support structure unit (i.e. ~ 15 m high) will be erected by excavating an area of 5 m deep by 1 m wide for the foundation. » Ready mix cement will be used to stabilise the foundation. Ready-mix cement will be prepared off-site and transported from the closest centre to the development. » A service cage will be erected around the foundation unit to allow for the establishment of the electrical and hydraulic infrastructure). This includes the transformer. » A drive head will be positioned on top of the

		<p>foundation unit as a connection point for the CPV panel which allows for the dual axis tracking.</p> <ul style="list-style-type: none"> » The CPV mega module will be lifted via a crane onto the drive head. » The installation of the 66 kV underground cables between the CPV panels, the transformers, the switchgear, and the Newgate Substation will require the excavation of trenches of approximately 1 m deep within which they can then be laid.
Undertake site rehabilitation		<ul style="list-style-type: none"> » Once construction is complete and all construction equipment is removed, the site must be rehabilitated where practical and reasonable. » On full commissioning of the facility any access points to the site which are not required during the operational phase must be closed and prepared for rehabilitation.

2.1.2. Operation and Maintenance Phase

Approximately 2 permanent and 12 semi-permanent workers are expected to be required on-site of which the latter will be low skilled positions required to clean the panels (once every 3 months). The facility is expected to be operational for 25 years.

The following operation and maintenance activities are expected to form part of the project scope of works.

Activity	Description
Operation of the CPV panels and associated electrical infrastructure	<ul style="list-style-type: none"> » The CPV panels will convert the light energy from the incoming radiation into electrical energy (i.e. as direct current). » The transformers will change the power to alternating current, where after the electricity will be conveyed to the switchgear, the underground 66 kV line and then to the Newgate Substation.
Cleaning of the CPV panels	<ul style="list-style-type: none"> » The CPV panels will be cleaned once every three months, or more often if deemed necessary. » Water is likely to be sourced from the Noupoort Municipality and will be trucked to the site when required. » It is assumed that approximately 6 tankers (each tanker holding 30 000 litres) will be required for each cleaning session.
Site operation and maintenance	<ul style="list-style-type: none"> » Each component within the solar energy facility will be operational except under circumstances of mechanical breakdown, unfavourable weather conditions, or routine maintenance activities. » As the CPV units use tracking technology the

hydraulic oil may need to be supplemented occasionally.

2.1.3. Decommissioning Phase

The solar energy facility is expected to have a lifespan of 25 years (i.e. with routine maintenance). The power plant infrastructure would only be decommissioned and rehabilitated once it has reached the end of its economic life. It is most likely that decommissioning activities would comprise the disassembly and replacement of the individual components with more appropriate technology/infrastructure available at that time.

The following decommissioning and rehabilitation activities will form part of the project scope.

Activity	Description
Site preparation	Site preparation activities will include confirming the integrity of the access to the site to accommodate the required equipment (e.g. decommissioning camp) and the mobilisation of decommissioning equipment.
Disassemble and replace existing components	The components would be disassembled, and reused and recycled (where possible), or disposed of in accordance with regulatory requirements.

2. FEASIBLE AND REASONABLE ALTERNATIVES

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

- (a) The property on which or location where it is proposed to undertake the activity;
- (b) The type of activity to be undertaken;
- (c) The design or layout of the activity;
- (d) The technology to be used in the activity;
- (e) The operational aspects of the activity; and
- (f) The option of not implementing the activity.

Describe 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 in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both are appropriate needs to be informed by the specific circumstances of the activity and its environment. 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.

Paragraphs 3 – 13 below should be completed for each alternative.

Site Alternative

A site alternative refers to the identification of more than one potential site which may be suitable for the establishment of a proposed facility. However, the nature of the site required for renewable energy generation projects often means that assessment of site alternatives is not possible. This specific site has been selected based on the following preferences:

- » The solar resource (i.e. the Daily Direct Normal Irradiance for the town of Noupoort is 7.21 kw/h);
- » Site access (i.e. the site is easily accessible from the N9 to Noupoort, and then via the R389 and a secondary gravel road which passes the Newgate Substation);
- » Site slope and topography; (i.e. the site proposed for the placement of the CPV panels is flat with no hills/mountains in the immediate vicinity that would cause shading issues or the need for excessive earthworks); and
- » Access to the national electricity grid for power evacuation (i.e. 66 kV underground cables will convey the power from the CPV units, through the transformers, to the switchgear and directly to the Newgate Substation) across a distance of less than 10 km. Underground cabling is preferred as there is no visible impact. The ground above the cables can be fully rehabilitated and used for normal farming activities.

As such, no site alternatives have been proposed for the establishment of the proposed solar energy facility.

Activity Alternative

CPV technology is favourable over CSP as it is quicker to implement and does not require water for operation. CPV is favoured over PV by virtue of its improved efficiency.

Layout Alternatives

The layout has considered environmental sensitivities. As such the preliminary layout has avoided these areas as far as possible.

Operating Alternatives

This refers to the manner in which a proposed facility would function. For example, should a wind energy facility prove problematic for avifauna during migrating periods, an operating alternative of switching off certain turbines during those times could be proposed. No operating alternatives would be applicable to the proposed solar energy facility as there are no feasible means of alternative operation for a facility of this nature.

3. 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 degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

List alternative sites, if applicable.

Alternative:

Alternative S1²

Alternative S2 (if any)

Alternative S3 (if any)

Latitude (S):

Longitude (E):

31	9.801	24	54.380

In the case of linear activities:

Alternative:

Alternative S1 (preferred or only route alternative)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

Latitude (S):

Longitude (E):

Alternative S2 (if any)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

Alternative S3 (if any)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250m along the route for each alternative alignment.

² "Alternative S." refers to site alternatives

4. PHYSICAL SIZE OF THE ACTIVITY

Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Alternative:

Alternative A1³

Alternative A2 (if any)

Alternative A3 (if any)

Size of the activity:

~190 000 m ²
m ²
m ²

Or, for linear activities:

Alternative:

Alternative A1

Alternative A2 (if any)

Alternative A3 (if any)

m
m
m

Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative:

Alternative A1

Alternative A2 (if any)

Alternative A3 (if any)

Size of the site/servitude:

m ²
m ²
m ²

5. SITE ACCESS

Does ready access to the site exist?

YES <input type="checkbox"/>	<input checked="" type="checkbox"/>
m	

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

Describe the type of access road planned:

The project development site is accessible from the N9 to Noupoort, then via the R389 and subsequently via a secondary road which passes the Newgate Substation and continues to intersect with the N1. The site can be accessed via a gravel road, whose entrance is directly opposite the Newgate Substation.

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site (refer to Appendix C).

³ "Alternative A." refers to activity, process, technology or other alternatives.

6. SITE OR ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

- 6.1 The scale of the plan which must be at least a scale of 1:500;
- 6.2 The property boundaries and numbers of all the properties within 50 metres of the site;
- 6.3 The current land use as well as the land use zoning of each of the properties adjoining the site or sites;
- 6.4 The exact position of each element of the application as well as any other structures on the site;
- 6.5 The position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;
- 6.6 All trees and shrubs taller than 1.8 metres;
- 6.7 Walls and fencing including details of the height and construction material;
- 6.8 Servitudes indicating the purpose of the servitude;
- 6.9 Sensitive environmental elements within 100 metres of the site or sites including (but not limited thereto):
 - Rivers;
 - The 1:100 year flood line (where available or where it is required by DWA);
 - Ridges;
 - Cultural and historical features;
 - Areas with indigenous vegetation (even if it is degraded or invested with alien species);
- 6.10 For gentle slopes the 1 metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and
- 6.11 The positions from where photographs of the site were taken.

A detailed site/route plan has been included in **Appendix A**.

7. SITE PHOTOGRAPHS

Colour photographs from the centre 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 Appendix B to this form. It must be supplemented with additional photographs of relevant features on the site, *if applicable*.

Colour photographs have been taken from the centre of the proposed site in the eight major compass directions, refer to **Appendix B**.

8. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of 1:200 as Appendix C 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.

A facility illustration which represents a realistic image of the planned solar energy facility is attached within **Appendix C**.

9. ACTIVITY MOTIVATION

9(a) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R3.3 billion
What is the expected yearly income that will be generated by or as a result of the activity?	R59.2 million/year
Will the activity contribute to service infrastructure?	YES ✓
Is the activity a public amenity?	NO ✓
How many new employment opportunities will be created in the development phase of the activity?	50
What is the expected value of the employment opportunities during the development phase?	This will become known after an initial total price has been calculated for the project.
What percentage of this will accrue to previously disadvantaged individuals?	The developer will, as far as possible, ensure maximum opportunities are given to the local community to participate in the construction phase
How many permanent new employment opportunities will be created during the operational phase of the activity?	Two
What is the expected current value of the employment opportunities during the first 10 years?	40000
What percentage of this will accrue to previously disadvantaged individuals?	75%

9(b) Need and desirability of the activity

Motivate and explain the need and desirability of the activity (including demand for the activity):

NEED:			
1.	Was the relevant provincial planning department involved in the application?	YES✓	
2.	Does the proposed land use fall within the relevant provincial planning framework?	YES✓	
3.	If the answer to questions 1 and / or 2 was NO, please provide further motivation / explanation:		

DESIRABILITY:			
1.	Does the proposed land use / development fit the surrounding area?	YES✓	
2.	Does the proposed land use / development conform to the relevant structure plans, SDF, and planning visions for the area?	YES✓	
3.	Will the benefits of the proposed land use / development outweigh the negative impacts of it?	YES✓	
4.	If the answer to any of the questions 1 - 3 was NO, please provide further motivation / explanation:		
5.	Will the proposed land use / development impact on the sense of place?		NO✓
6.	Will the proposed land use / development set a precedent?		NO✓
7.	Will any person's rights be affected by the proposed land use / development?		NO✓
8.	Will the proposed land use / development compromise the "urban edge"?		NO✓
9.	If the answer to any of the question 5 - 8 was YES, please provide further motivation / explanation.		

BENEFITS:			
1.	Will the land use / development have any benefits for society in general?	YES✓	
2.	Explain: The evacuation of additional power into the Eskom grid will serve to increase the country's energy mix and the stability of the grid for the immediate area.		
3.	Will the land use / development have any benefits for the local communities where it will be located?	YES✓	
4.	Explain: Job opportunities, albeit limited, will be created during the		

	construction (i.e. 50) and operation (i.e. 2 permanent and 12 semi-permanent) of the proposed facility.
--	--

10. 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, if applicable:

Title of legislation, policy or guideline: **Administering authority:** **Date:**

National Environmental Management Act (Act No. 107 of 1998)	<ul style="list-style-type: none"> » National Department of Environmental Affairs » Limpopo Department of Economic Development, Environment, and Tourism 	1998
National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	<ul style="list-style-type: none"> » National Department of Environmental Affairs 	2004
National Environmental Management: Waste Act (Act No. 59 of 2008)	<ul style="list-style-type: none"> » National Department of Water Affairs » Provincial Department of Environmental Affairs 	2008
National Water Act (Act No. 36 of 1998)	<ul style="list-style-type: none"> » National Department of Water Affairs » Northern Cape Department of Water Affairs 	1998
Environment Conservation Act (Act No. 73 of 1989)	<ul style="list-style-type: none"> » National Department of Environmental Affairs » Northern Cape Department of Environment and Nature Conservation » Local Authority 	1989
Minerals and Petroleum Resources Development Act (Act No. 28 of 2002)	<ul style="list-style-type: none"> » Department of Minerals and Energy 	2002
National Heritage Resources Act (Act No. 25 of 1999)	<ul style="list-style-type: none"> » South African Heritage Resources Agency 	1999
National Forests Act (Act No. 84 of 1998)	<ul style="list-style-type: none"> » National Department of Forestry 	1998
National Veld and Forest Fire Act (Act 101 of 1998)	<ul style="list-style-type: none"> » Department of Forestry 	1998
Government Notice No. 1477 of 2009: Draft National List of Threatened Ecosystems	<ul style="list-style-type: none"> » Provincial Department of Environmental Affairs 	2009
Subdivision of Agricultural Land Act (Act No. 70 of 1970)	<ul style="list-style-type: none"> » National Department of Agriculture 	1970

Hazardous Substances Act (Act No. 15 of 1973)	» Department of Health	1973
National Road Traffic Act (Act No 93 of 1996)	» South African National Roads Agency Limited (national roads) » Provincial Department of Transport	1996
Development Facilitation Act (Act No 67 of 1995)	» Local and District Municipality	1995
Promotion of Access to Information Act (Act No. 2 of 2000)	» National Department of Environmental Affairs	2000
Promotion of Administrative Justice Act (Act No. 3 of 2000)	» National Department of Environmental Affairs	2000
Guideline Documents		
Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads	» Provincial Department of Transport	
Provincial Planning		
Land Use Planning Ordinance 15 of 1985	» Details land subdivision and rezoning requirements and procedures	1985
Policies and White Papers		
The White Paper on the Energy Policy of the Republic of South Africa (December 1998)	» N/A	1998
The White Paper on Renewable Energy (November 2003)	» N/A	2003
The White Paper on the Energy Policy of the Republic of South Africa (December 1998)	» N/A	N/A
Miscellaneous		
Pixley Ka Seme District Municipality	» IDP	2009 - 2012

11. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

11(a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

YES ✓

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

Packaging materials for the various components, excess concrete spillage and excess building materials will be produced on site during the construction phase.

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

Waste bins/skips will be placed on site to collect the waste materials and these will be disposed of on a weekly/monthly basis dependent on quantities.

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

Reputable waste disposal companies will be used to dispose of the waste. These companies will be audited to ensure they dispose of waste effectively and legally.

Will the activity produce solid waste during its operational phase?

NO ✓
 m³

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

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

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

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, then 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

NO ✓

treatment facility?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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If yes, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

11(b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?

<input type="checkbox"/>	<input checked="" type="checkbox"/>	NO ✓
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If yes, what estimated quantity will be produced per month?

m ³

Will the activity produce any effluent that will be treated and/or disposed of on site?

<input type="checkbox"/>	<input checked="" type="checkbox"/>	NO ✓
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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.

Will the activity produce effluent that will be treated and/or disposed of at another facility?

<input type="checkbox"/>	<input checked="" type="checkbox"/>	NO ✓
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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:

--

11(c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere?

<input type="checkbox"/>	<input checked="" type="checkbox"/>	NO ✓
--------------------------	-------------------------------------	----------------

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

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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:

Solar energy installations operate by converting solar energy into electricity. This is characterised as a non-consumptive use of a natural resource and consumes no fuel for its continuing operation. Solar power produces an insignificant quantity of greenhouse gases over its lifecycle as compared to conventional coal-fired power stations. The operational phase of a solar facility does not produce carbon dioxide, sulphur dioxide, mercury, particulates, or any other type of air pollution.

11(d) Generation of noise

Will the activity generate noise?

	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 noise in terms of type and level:

12. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(s)

Municipal ✓	Water board	Groundwater	River, stream, dam or lake	Other	The activity will not use water
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Water will be used to clean the CPV panels once every three months, or more frequently if deemed necessary. Water will be trucked in (i.e. likely from Noupoort) and high pressure hoses will be used to clean the panels. It is estimated that for every cleaning session 6 tankers of water will be required (i.e. where each tanker is assumed to hold 30 000 l).

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:

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

		NO ✓
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If yes, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this application if it has been submitted.

13. ENERGY EFFICIENCY

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

Not applicable.

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

This is not applicable, as the installation itself is a renewable/alternative energy project.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

For linear activities (pipelines, etc.) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section C and indicate the area, which is covered by each copy No. on the Site Plan.

Section C Copy No. (e.g. A):

1. Paragraphs 1 - 6 below must be completed for each alternative.

2. Has a specialist been consulted to assist with the completion of this section?

YES ✓	
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If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed.

All specialist reports must be contained in **Appendix D**.

Property description/physical address:

Portion 1 of the Farm Toitdale 167

(Farm name, portion etc.) Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application.

In instances where there is more than one town or district involved, please attach a list of towns or districts to this application.

Current land-use zoning:

Agricultural

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to , to this application.

Is a change of land-use or a consent use application required?

YES ✓	
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Must a building plan be submitted to the local authority?

	NO ✓
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Locality map: An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (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 map must indicate the following:

- An indication of the project site position as well as the positions of the alternative sites, if any;
- Road access from all major roads in the area;
- Road names or numbers of all major roads as well as the roads that provide access to the site(s);
- All roads within a 1km radius of the site or alternative sites; and
- A north arrow;
- A legend; and
- Locality GPS co-ordinates (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 degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection).

The locality map has been included and attached as **Appendix A**:

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

Flat✓	1:50	-	1:20	-	1:15	-	1:10	-	1:7,5	-	Steeper than 1:5
	1:20		1:15		1:10		1:7,5		1:5		

Alternative S2 (if any):

Flat	1:50	-	1:20	-	1:15	-	1:10	-	1:7,5	-	Steeper than 1:5
	1:20		1:15		1:10		1:7,5		1:5		

Alternative S3 (if any):

Flat	1:50	-	1:20	-	1:15	-	1:10	-	1:7,5	-	Steeper than 1:5
	1:20		1:15		1:10		1:7,5		1:5		

2. LOCATION IN LANDSCAPE

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

Alternative S1:

- 2.1 Ridgeline
- 2.2 Plateau
- 2.3 Side slope of hill/mountain
- 2.4 Closed valley
- 2.5 Open valley

2.6 Plain

- 2.7 Undulating plain / low hills
- 2.8 Dune
- 2.9 Seafront

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following (tick the appropriate boxes)?

	Alternative S1:	Alternative S2 (if any):		Alternative S3 (if any):	
Shallow water table (less than 1.5m deep).	NO ✓	YES	NO	YES	NO
Dolomite, sinkhole, or doline areas.	NO ✓	YES	NO	YES	NO
Seasonally wet soils (often close to water bodies).	NO ✓	YES	NO	YES	NO
Unstable rocky slopes or steep slopes with loose soil.	NO ✓	YES	NO	YES	NO
Dispersive soils (soils that dissolve in water).	NO ✓	YES	NO	YES	NO
Soils with high clay content (clay fraction more than 40%).	NO ✓	YES	NO	YES	NO
Any other unstable soil or geological feature.	NO ✓	YES	NO	YES	NO
An area sensitive to erosion.	YES ✓	YES	NO	YES	NO

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

4. GROUNDCOVER

Indicate the types of groundcover present on the site:

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

Alternative S1:

Natural veld - good condition ^E	Natural veld with scattered aliens^{E✓}	Natural veld with heavy alien infestation ^E	Veld dominated by alien species ^E	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an "E" is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

Dr. Gareth Coombs was appointed to undertake an ecological study for the proposed facility, refer to Appendix D1.

5. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that does currently occur within a 500 m radius of the site and give description of how this influences the application or may be impacted upon by the application:

5.1 Natural area ✓

- 5.2 Low density residential
- 5.3 Medium density residential
- 5.4 High density residential
- 5.5 Informal residential^A
- 5.6 Retail commercial and warehousing
- 5.7 Light industrial
- 5.8 Medium industrial^{AN}
- 5.9 Heavy industrial^{AN}
- 5.10 Power station
- 5.11 Office/consulting room
- 5.12 Military or police base/station/compound
- 5.13 Spoil heap or slimes dam^A
- 5.14 Quarry, sand, or borrow pit
- 5.15 Dam or reservoir
- 5.16 Hospital/medical centre
- 5.17 School
- 5.18 Tertiary education facility
- 5.19 Church
- 5.20 Old age home
- 5.21 Sewage treatment plant^A

- 5.22 Train station or shunting yard ^N
- 5.23 Railway line ^N
- 5.24 Major road (4 lanes or more) ^N
- 5.25 Airport ^N
- 5.26 Harbour
- 5.27 Sport facilities
- 5.28 Golf course
- 5.29 Polo fields
- 5.30 Filling station ^H
- 5.31 Landfill or waste treatment site
- 5.32 Plantation

5.33 Agriculture ✓ (Grazing)

- 5.34 River, stream or wetland
- 5.35 Nature conservation area
- 5.36 Mountain, koppie or ridge
- 5.37 Museum
- 5.38 Historical building
- 5.39 Protected Area
- 5.40 Graveyard
- 5.41 Archaeological site
- 5.42 Other land uses (describe)

If any of the boxes marked with an "N" are ticked, how will this impact / be impacted upon by the proposed activity?

If any of the boxes marked with an "AN" are ticked, how will this impact / be impacted upon by the proposed activity?

If YES, specify and explain:

If YES, specify:

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity.

If YES, specify and explain:

If YES, specify:

6. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including

YES✓

Archaeological or palaeontological sites, on or close (within 20m) to the site?

YES✓

If YES, explain:

Isolated occurrences of very weathered and patinated Middle Stone Age (MSA) stone artefacts were observed within the proposed 20 ha area for the development of the solar facility (refer to Figure 5). It is unlikely that these Middle Stone Age stone artefact occurrences are *in situ* and are, therefore, considered being in a secondary context. Although it is possible that stone artefacts may occur *in situ* between the surface and 50 cm – 80 cm below ground.

No sites containing any depth of deposit or other archaeological material associated with the stone tool artefacts were observed within the area.

The proposed area for development is considered as having a low cultural significance, and the following recommendations must be taken into consideration prior to the construction activities.

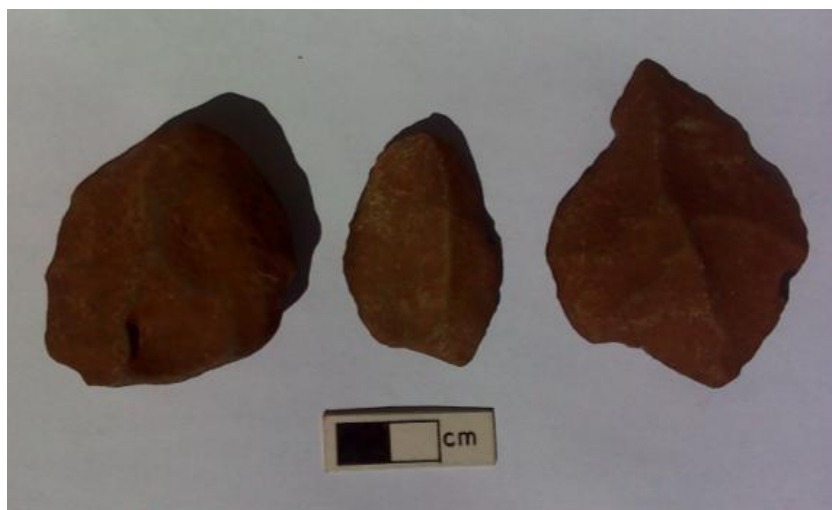


Figure 5: Examples of the stone artefacts documented

If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist:

As above.

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 submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENTS AND NOTICES

- » A2 site notices were placed on the boundary fence of the project development site (i.e., at gates along existing access roads).
- » A4 site notices were also placed at the Noupoort Library, the Noupoort Municipality and a local hardware store.
- » A stakeholder letter was distributed to the database which included key stakeholders and organs of state relevant to the proposed project. The stakeholder letters served to announce the proposed project, and announce the review period for the draft Basic Assessment Report.
- » A flyer was distributed in the town of Noupoort.
- » An advert was placed in the De Aar Echo to advertise the Basic Assessment process and the availability of the draft Basic Assessment Report.

Refer to Appendix E for proof of placement of the advertisements, site notice, and letters to stakeholders.

2. CONTENT OF ADVERTISEMENTS AND NOTICES

The contents of the notices and adverts were in accordance with the following requirements:

- (a) Indicate the details of the application which is subjected to public participation; and
- (b) State –
 - (i) That the application has been submitted to the competent authority in terms of these Regulations, as the case may be;
 - (ii) Whether basic assessment or scoping procedures are being applied to the application, in the case of an application for environmental Authorisation;
 - (iii) The nature and location of the activity to which the application relates;
 - (iv) Where further information on the application or activity can be obtained; and
 - (iv) The manner in which and the person to whom representations in respect of the application may be made.

3. PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the competent authority in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any Gazette that is published specifically for the purpose of providing notice to the public of applications made in terms of the EIA regulations.

Advertisements and notices must make provision for all alternatives.

The proposed installation is unlikely to result in any direct impacts that extend beyond the municipal area where it is located. As such it was only deemed necessary to advertise in one newspaper.

The advertisement placed detailed the Basic Assessment process, the nature, and location of the proposed project, where further information on the proposed activity could be obtained and the manner in which representations on the application could be made. The advertisement also indicated the availability of the draft Basic Assessment Report for public review.

Copies of the advertisement and proof of placement is included within Appendix E.

4. DETERMINATION OF APPROPRIATE MEASURES

The practitioner must ensure that the public participation 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, ratepayers associations and traditional authorities where appropriate. 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 inadequate.

The use of a stakeholder database, stakeholder letters, flyers, advertisements, site notices, and a public meeting (to be held in January 2012) was deemed adequate for the involvement of the public in the process.

5. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments and respond to each comment of the public before the application is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to this application. The comments and response report must be attached under Appendix E.

All comments received, as well as responses provided will be captured and recorded within the Comments and Response Report attached with the final Basic Assessment Report.

6. AUTHORITY PARTICIPATION

Please note that a complete list of all organs of state and or any other applicable authority with their contact details must be appended to the basic assessment report or scoping report, whichever is applicable.

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.

Authorities were informed of the Basic Assessment process through the submission of a stakeholder letter, these included, but was not limited to:

- » DENC
- » Umsobomvu Local Municipality
- » Pixley ka Seme District Municipality
- » Provincial Department of Agriculture
- » National Department of Agriculture
- » Provincial Department of Water Affairs
- » South African National Roads Agency Limited
- » Northern Cape Department of Roads and Public Works
- » Northern Cape Department of Economic Development
- » South African Civil Aviation Authority
- » South African Heritage Resources Agency
- » Northern Cape Heritage Authority / Ngwao Bošwa Kapa Bokone

List of authorities from whom comments have been received:

To date no comment has been received from authorities.

7. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for linear activities, or where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub regulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable.

Through the Basic Assessment Process other stakeholders will be registered on the I&AP database.

A stakeholder database of is attached in Appendix E.

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):

All comments received, as well as responses provided will be captured and recorded within the Comments and Response Report attached with the final Basic Assessment Report.

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2010, and should consider applicable official guidelines. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the main issues raised by interested and affected parties.

All comments received, as well as responses provided will be captured and recorded within the Comments and Response Report attached with the final Basic Assessment Report.

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached to this report as Annexure E):

No comments have been raised to date.

2. IMPACTS THAT MAY RESULT FROM THE PLANNING, DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING, AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

List the potential direct, indirect and cumulative property / activity / design / technology / operational alternative related impacts (as appropriate) that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed.

2.1. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN PHASE

Alternative (preferred alternative)

No impacts are anticipated that may result from the planning and design phase of the proposed development.

2.2. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential impacts associated with the construction of the proposed project are discussed below. The following methodology was used in assessing impacts related to the proposed development. All impacts are assessed according to 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; or;
 - * 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); and
 - * 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); and
 - * 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).

Impacts on Ecology

The vegetation of the study area is within the upper Karroo Bioregion. The vegetation surrounding Noupoort is classified as the Eastern upper Karroo. This vegetation currently falls under the conservation status of least threatened and is one of the most widespread vegetation types currently classified in South Africa.

Most of the vegetation consists of arid shrubs, smaller shrubs, and succulents. Three species that are of concern are Kapokbos (*Eriocephalus grandiflorus*, IUCN status - Rare), Bushman Poison Bulb (*Boophone disticha*, IUCN status - Declining) and *Marasmodes undulata* (no common name, IUCN status Critically Rare). However none of these are currently listed in the TOPS: NEMBA list and thus do not require permits to be removed. It is however recommended that the site should be checked for the presence of *Marasmodes undulata* as this is a critically rare species.

Two species of birds that occur in the area are of concern and fall under the IUCN category of Endangered species. These are the Grey Crowned Crane (*Balearica regulorum*) and the Blue Crane (*Anthropoides paradiseus*). A raptor species of concern is the black harrier (*Circus maurus*) which is listed globally as Vulnerable (VU) but is Near Threatened in South Africa. Habitat of Black harriers occurring in the Karroo consists mostly of dry scrub and agricultural fields.

The reptile fauna of this region consists mostly of blind snakes, girdled and rock lizards, as well as smaller snakes (i.e. Skaapsteker, *Psammodromus rufus*). Most of these species utilise rock crevices and large boulders as habitat. Burrowing snake species such as Delalande Blind Snake (*Rhinotyphlops lalandei*) occur in the area, as well as larger snakes (e.g. Cape Cobra, *Naja nivea*; Coral Snake (*Aspilaps lubricus infuscatus*) and Puff Adder (*Bitis arietans*). The area also has several species of lizards (e.g. Spotted Sandveld Lizard, Spotted Sand Lizard as well as girdled Lizards (Cordylidae). All of

these species use are ground dwelling species and could be affected through the removal of vegetation, rocky substrates, and large boulders. None of the reptiles that have been recorded in the study site are listed species.

The mammalian fauna of the area consists mostly of small rodents (i.e. Namaqua Rock Mouse, *Micaelamys namaquensis*), shrews (i.e. Reddish Grey Musk Shrew, *Crocidura cyanea*), and Rats (i.e. Brants Whistling Rat, *Parotomys brantsii*). Many of these species are either burrowing species (i.e. Pygmy Mouse, *Mus munutoides*) or use rocky habitats (i.e. Brants Whistling Rat, *Gerbillurus paeba*), or are burrowing species (e.g. Hairy Footed Gerbil, Slogetts Vlei Rat, Eastern Rock Elephant Shrew). Other species use grass tussocks (Round eared elephant shrew). Some arboreal (tree living) species also occur in the area (i.e. woodland dormouse). Other species use a combination of these habitats (i.e. Round eared elephant shrews; *Macroscelides proboscideus*). It is however important to note that some of the large mammals listed in this list (e.g. Brown Hyena, Eland, Gemsbok, and Bontebok) are unlikely to still occur in this area due to local extinction and changes in land use (e.g. game farming). None of the species present in this area is listed as endangered.

Nature: Possible impacts of the removal of vegetation and soil

Due to the aridity of the environment, several problems may exist when development takes place. Species growing in these regions are typically arid adapted and thus many (excluding grasses and other perennials) require long growth periods. Therefore any excavation or removal of topsoil and vegetation will take relatively long periods to recover. The construction of solar power panels requires is likely to have some shading effects, implying that many species (e.g. succulents) which are adapted to high sunlight conditions may be affected.

	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Minor (2)	Zero (0)
Probability	Highly probable (4)	Probable (3)
Significance	Moderate (32)	Low (18)
Status (positive or negative)	Neutral	
Reversibility	No	
Irreplaceable loss of resources?	No	
Can impact be mitigated?	Yes	
Mitigation measures:		
» Care should be taken to cause minimum damage to the environment with construction equipment and any subsequent activities on site (e.g. access routes to site, storage areas for equipment).		
Cumulative impact:		
» Cumulative impact may occur as a result of the combined clearing required for multiple solar and wind energy facilities in the region.		
Residual impact:		
» None expected.		

Nature: Impact of clearing activities on habitat for avifauna		
Both the Grey Crowned Crane and the Blue Crane breed during summer and clearing activities / development may affect existing nesting sites.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Minor (2)	Zero (0)
Probability	Improbable (2)	Very improbable (1)
Significance	Low (16)	Low (6)
Status (positive or negative)	Negative	
Reversibility	No	
Irreplaceable loss of resources?	Yes	
Can impact be mitigated?	Yes	
Mitigation measures:		
<ul style="list-style-type: none"> » The proposed site should be thoroughly checked for the presence of nesting sites of endangered bird species. If these are present, nest should either be removed (permit application required) or development should proceed in the non-breeding season. Care should also be taken to cause minimum damage to the environment with construction equipment and any subsequent activities on site (e.g. access routes to site, storage areas for equipment). » Environmental monitoring officer should record bird species present on site before development takes place and after development takes place in order to determine whether birds there are any significant changes in bird species composition due to the presence of the CPV panels. 		
Cumulative impact:		
<ul style="list-style-type: none"> » Cumulative impact may occur as a result of the combined impact from multiple solar and wind energy facilities in the region. 		
Residual impact:		
<ul style="list-style-type: none"> » Impacts on breeding pairs of threatened species may have a residual impact on the status of the species in general. 		

Nature: Impact of clearing activities on habitat for reptiles		
The reptile fauna of this region are ground dwelling species and may be affected through the removal of vegetation, rocky substrates, and large boulders.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (4)	Minor (2)
Probability	2 (Some possibility, but low likelihood)	2 (Some possibility, but low likelihood)
Significance	Low (20)	Low (16)
Status (positive or negative)	Negative	
Reversibility	No	
Irreplaceable loss of resources?	No	
Can impact be mitigated?	Yes	
Mitigation measures:		

<ul style="list-style-type: none"> » Restrict construction activities to the developmental footprint as far as possible. » Use designated access roads. » Monitor site for presence of reptiles, these could potentially be trapped and translocated.
<p>Cumulative impact:</p> <ul style="list-style-type: none"> » None.
<p>Residual impact:</p> <ul style="list-style-type: none"> » None.

<p>Nature: Impact of clearing activities on habitat for avifauna</p> <p>Both the Grey Crowned Crane and the Blue Crane breed during summer and clearing activities / development may affect existing nesting sites.</p>		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Minor (2)	Zero (0)
Probability	Improbable (2)	Very improbable (1)
Significance	Low (16)	Low (6)
Status (positive or negative)	Negative	
Reversibility	No	
Irreplaceable loss of resources?	Yes	
Can impact be mitigated?	Yes	
<p>Mitigation measures:</p> <ul style="list-style-type: none"> » The proposed site should be thoroughly checked for the presence of nesting sites of endangered bird species. If these are present, nest should either be removed (permit application required) or development should proceed in the non-breeding season. Care should also be taken to cause minimum damage to the environment with construction equipment and any subsequent activities on site (e.g. access routes to site, storage areas for equipment). » Environmental monitoring officer should record bird species present on site before development takes place and after development takes place in order to determine whether birds there are any significant changes in bird species composition due to the presence of the CPV panels. 		
<p>Cumulative impact:</p> <ul style="list-style-type: none"> » Cumulative impact may occur as a result of the combined impact from multiple solar and wind energy facilities in the region. 		
<p>Residual impact:</p> <ul style="list-style-type: none"> » Impacts on breeding pairs of threatened species may have a residual impact on the status of the species in general. 		

<p>Nature: Impact of clearing activities on habitat for mammals</p> <p>The construction of the CPV panels could disturb and remove some of the required habitat.</p>		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)

Duration	Permanent (5)	Permanent (5)
Magnitude	Low (4)	Minor (2)
Probability	2 (Some possibility, but low likelihood)	2 (Some possibility, but low likelihood)
Significance	Low (20)	Low (16)
Status (positive or negative)	Negative	
Reversibility	No	
Irreplaceable loss of resources?	No	
Can impact be mitigated?	Yes	
Mitigation measures:		
<ul style="list-style-type: none"> » The proposed site should be thoroughly checked for the presence of burrows of small mammals. » In areas where a high density of these occur, development should be avoided. Further care should also be taken to cause minimum damage to the environment with construction equipment and any subsequent activities on site (e.g. access routes to site, storage areas for equipment). 		
Cumulative impact:		
<ul style="list-style-type: none"> » Cumulative impact may occur as a result of the combined impact from multiple solar and wind energy facilities in the region. 		
Residual impact:		
<ul style="list-style-type: none"> » None. 		

Impacts on Geology, soils, and agricultural potential

The project development site lies in the Da14 land type but the project development site lies in the Da14 land type only. The soils are predominantly shallow and structured duplex soils with the occasional red or yellow-brown apedal profile. Rock outcrops and rocky soils occur in higher lying landscape positions and lower lying landscape positions are dominated by soils that have varied cutanic character indicating signs of incipient soil formation (i.e. typical of recently transported soil materials (geological timescales)). In terms of land capability and land use, the site is can be used exclusively for extensive grazing due to climatic and soil constraints. The agricultural potential is low due to often erratic rainfall (less than 400 mm per year), high evaporative demand, and shallow duplex soils. Dryland crop production is not viable in areas with rainfall lower than 500 mm unless significant shallow groundwater is available (not the case for the specific survey site).

The soils of the area are characterised by shallow profiles, distinct structure in the subsoil horizons and very widespread crust formation on the soil surface. The crusts on the soil surface are due to arid climatic conditions, the dominance of silt and clay fraction material in the soils as well as the presence of relatively high levels of Na and Mg in the soils. The vegetation in the area is sparse with the consequence that the crusts dominate the site

Storm water management is considered be very critical on the site due to the tendency of the soils to form crusts and impediments to infiltration. Depending on the design of the CPV facility, the site can still be used for grazing after the development. The increased shade due to the panels could provide improved grazing.



Figure 6: Widespread surface crusts and sparse vegetation on the site leading to increased runoff and decreased infiltration of water

<i>Nature: The construction of the CPV panels, buildings, roads, and other infrastructure with the associated disturbance of soils and existing land use.</i>		
	<i>Without mitigation</i>	<i>With mitigation</i>
<i>Extent</i>	Site (1)	N/A
<i>Duration</i>	Permanent (5)	N/A
<i>Magnitude</i>	Minor (2)	N/A
<i>Probability</i>	Highly probable (4)	N/A
<i>Significance</i>	Moderate (32)	N/A
<i>Status (positive or negative)</i>	Negative	
<i>Reversibility</i>	No	
<i>Irreplaceable loss of resources?</i>	Yes	
<i>Can impacts be mitigated?</i>	No	
<i>Mitigation measures:</i>		
» None possible		
<i>Cumulative impact:</i>		
» The cumulative impact will be small as it is constructed on land with low agricultural potential.		
<i>Residual impact:</i>		
» None expected.		

Nature: Vehicle operation on site		
It is assumed that vehicle movement will be restricted to the construction site and established roads. Vehicle impacts in this sense are restricted to spillages of lubricants and petroleum products.		
	Without mitigation	With mitigation
Extent	Site (1)	Site (1)
Duration	Short term (2)	Short term (2)
Magnitude	Minor (2)	Minor (2)
Probability	Highly probable (4)	Improbable (2)
Significance	Low (20)	Low (10)
Status (positive or negative)		
	Negative	
Reversibility		
	No	
Irreplaceable loss of resources?		
	Yes	
Can impacts be mitigated?		
	Yes	
Mitigation measures:		
	» Maintain vehicles, prevent and address spillages.	
Cumulative impact:		
	» The cumulative impact of this activity will be small if managed.	
Residual impact:		
	» None expected.	

Nature: Dust generation		
This activity entails the operation of vehicles on site and their associated dust generation.		
	Without mitigation	With mitigation
Extent	Local (2)	Local (2)
Duration	Short term (2)	Short term (2)
Magnitude	Minor (2)	Minor (2)
Probability	Highly probable (4)	Improbable (2)
Significance	Low (24)	Low (12)
Status (positive or negative)		
	Negative	
Reversibility		
	No	
Irreplaceable loss of resources?		
	Yes	
Can impacts be mitigated?		
	Yes	
Mitigation measures:		
	» Limit vehicle movement to absolute minimum, construct proper roads for access.	
Cumulative impact:		
	» The cumulative impact of this activity will be small if managed but can have widespread impacts if ignored.	
Residual impact:		
	» None expected.	

Nature: Agricultural potential		
Loss of agricultural potential and land capability owing to the development.		
	Without mitigation	With mitigation
Extent	Site (1)	Site (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Minor (2)	Minor (2)
Probability	Highly probable (4)	Highly probable (4)
Significance	Moderate (32)	Moderate (32)
Status (positive or negative)		
	Negative	
Reversibility		
	No	
Irreplaceable loss of resources?		
	Yes	
Can impacts be mitigated?		
	No	
Mitigation measures:		
» The loss of agricultural land is a long term loss and there are no mitigation measures that can be put in place to combat this loss.		
Cumulative impact:		
» Soil erosion may arise owing to increased surface water runoff. Adequate management and erosion control measures should be implemented.		
Residual impact:		
» The loss of agricultural land is a long term loss. This loss extends to the post-construction phase. The agricultural potential is very low though.		

Impacts on Heritage Resources

Isolated occurrences of very weathered and patinated Middle Stone Age (MSA) stone artefacts were observed within the proposed 20 ha area for the development of the solar facility (refer to Figure 5). It is unlikely that these Middle Stone Age stone artefact occurrences are *in situ* and are, therefore, considered being in a secondary context. Although it is possible that stone artefacts may occur *in situ* between the surface and 50 cm – 80 cm below ground.

No sites containing any depth of deposit or other archaeological material associated with the stone tool artefacts were observed within the area.

The proposed area for development is considered as having a low cultural significance, and the following recommendations must be taken into consideration prior to the construction activities.

Nature: Disturbance to possible surface and sub-surface pre-colonial archaeology heritage remains.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (4)	Minor (2)
Probability	Improbable (2)	Improbable (2)
Significance	Low (20)	Low (16)

Status (positive or negative)	Negative
Reversibility	No
Irreplaceable loss of resources?	Yes
Can impact be mitigated?	Yes
Mitigation measures:	
<ul style="list-style-type: none"> » A professional archaeologist (with an already authorised collection permit) must be appointed during the various phases of development including vegetation clearing and the excavation activities to monitor and identify possible archaeological material remains and features that may occur below the surface and further make appropriate recommendations on removing and / or protecting the archaeological material remains and features. » If concentrations of archaeological heritage material and human remains are uncovered during construction, all work must cease immediately and be reported to the Albany Museum (046 622 2312) and/or the South African Heritage Resources Agency (SAHRA) (021 642 4502) so that systematic and professional investigation/ excavation can be undertaken. » Construction managers/foremen must be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites. 	
Cumulative impact:	
» Low	
Residual impact:	
» Irreplaceable loss of archaeological heritage resources	

Impacts on the visual aesthetics

Nature: Potential visual impact of construction on observers in close proximity to the proposed solar energy facility		
There will be a noticeable increase in heavy vehicles utilising the roads to the development site that may cause, at the very least, a visual nuisance to other road users and land owners in the area. Dust from construction work could also result in potential visual impact.		
	Without mitigation	With mitigation
Extent	Local (4)	Local (4)
Duration	Very short term (1)	Very short term (1)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Improbable (2)
Significance	Moderate (33)	Low (22)
Status (positive or negative)		
Negative		
Reversibility		
Recoverable (3)		
Irreplaceable loss of resources?		
No		
Can impact be mitigated?		
Yes		
Mitigation measures:		
<u>Planning:</u>		
» Retain and maintain natural vegetation in all areas outside of the development		

<p>footprint.</p> <p>Construction:</p> <ul style="list-style-type: none"> » Proper planning and management of the construction site. » Ensure that vegetation is not cleared unnecessarily during the construction period. » Rehabilitation of construction areas
<p>Cumulative impact:</p> <ul style="list-style-type: none"> » None.
<p>Residual impact:</p> <ul style="list-style-type: none"> » None.

Impacts on the socio-economic environment

Nature: Job creation		
Approximately 50 people are expected to be required during the construction phase which is expected to take place over a period of 6 months) of which 30% is estimated to be low skilled/semi-skilled positions, and 70% skilled.		
	Without enhancement	With enhancement
Extent	Local (1)	Local (1)
Duration	Very short (2) *	Very short (2) *
Magnitude	Minor (2)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Low (15)	Low (21)
Status (positive or negative)	Positive	
Reversibility	N/A	
Irreplaceable loss of resources?	N/A	
Can impact be enhanced?	Yes	
Mitigation measures:		
» Maximise the use of local labour for low – semi skilled jobs far as possible.		
Cumulative impact:		
» The development of additional renewable energy facilities in the region may serve to increase the potential for job creation.		
Residual impact:		
» Once the construction phase is complete, locals may not be able to find future employment.		
» Alternatively local employed during the construction phase may learn new skills thereby making them more employable in the future.		

No Go Alternative

Also referred to as the 'Do-nothing' option, this refers to Toitdale Solar Energy not constructing the proposed solar energy facility. In this scenario the potential environmental and social impacts will not occur and the status quo will be maintained. However, should the project not proceed the distributed approach regarding the government target for renewable energy will not be realised. As a result the distributed range of socio-economic and environmental benefits for South Africa would not be realised.

2.3. IMPACTS THAT MAY RESULT FROM THE OPERATIONAL PHASE

Impacts on the visual aesthetics

The dominant topographical unit or terrain type is *mountains* to the south and south east of the study area. While to the north and west the area is dominated by *undulating open plains*. The site itself is mostly situated on relatively flat land (refer to Figure 6).



Figure 6: The dominant topographical unit or terrain type of the study area

The potential visual exposure

The proposed facility has a core zone of potentially high visual exposure on the site, and within 2 km, especially along a limited section of the R389 and a length of the secondary road running past the Newgate substation to Caroluspoort. Visually protected areas occur in the far north and south as well as to the west beyond the 2 km but within a 4 km radius. This visually exposed zone includes no homesteads or similar infrastructure. A length of railway line within this radius will potentially be visually exposed.

The visual character of this area is strongly influenced by the presence of the Newgate Substation and the associated power lines.

The zone of potential visual exposure is slightly more widespread in the medium distance (i.e. between 2 km and 4 km), but with significantly larger, visually protected areas in between. Visually exposed areas lie to the east, north east and south east of the site. The homestead of Caroluspoort as well as the northern outskirts of the town of Noupoort falls within this zone of potential visual exposure, as do sections of the R389 in the south and south east. Most of the railway line to the south east will also potentially be visually exposed.

In the medium to longer distance (i.e. beyond 4 km), visual exposure is significantly reduced in the east, south east south west, west and north west . Visual exposure is non-existent in the far north, south, south-west and south-east. Visually exposed areas also include the south and south easterly facing slopes of the hills in the north, as well as the north and north westerly facing slopes of the mountains in the south. The north and north western outskirts of the town of Noupoort will also be visually affected. Homesteads falling within the visually exposed zone include De Kruis, Kwa-Zumuxolo, Cypherkuil and Toitdale. Visually exposed roads include limited sections of the N9 (in the east). Parts of Noupoort, particularly the north western outskirts, and surrounds will be exposed to potential visual impact. It is unlikely, however, that the facility will be visible from this distance.

It is envisaged that the proposed facility would be visible to observers travelling along roads and railway lines, residents of Noupoort and of homesteads and farms as well as tourists visiting the region, within (but not restricted to) an 8 km radius of the facility.

Visual absorption capacity

The climate is semi-arid, with the study area receiving between 320 mm and 433 mm of rainfall per annum. Land cover is primarily shrubland with patches of grassland and thicket and bushland. As such, the overall Visual Absorption Capacity (VAC) of the receiving environment is low due to the nature and height of the vegetation, and the largely undeveloped state of the receiving environment. VAC will thus not be taken into account in the undeveloped environment.

The VAC within the town of Noupoort will be higher and was taken into account as part of the visual impact assessment. For this reason the urban areas are not indicated as sensitive visual receptors, as the VAC of the buildings and infrastructure will render visual impact to be largely negligible from within these areas.

Viewer incidence

Viewer incidence is calculated to be the highest along the national road (i.e. the N9) and arterial roads (i.e. the R389) as well as along the secondary roads within the study area. Commuters using these roads could be negatively impacted upon by visual exposure to the facility. Other than along these roads, viewer incidence will be concentrated in the town of Noupoort and within the agricultural homesteads and settlements within the study area.

Commuters on the railway lines (especially passenger trains) also represent visual receptors, but are not considered to be sensitive to visual intrusion, especially in such close proximity to Noupoort.

The severity of the visual impact on visual receptors decreases with increased distance from the proposed facility.

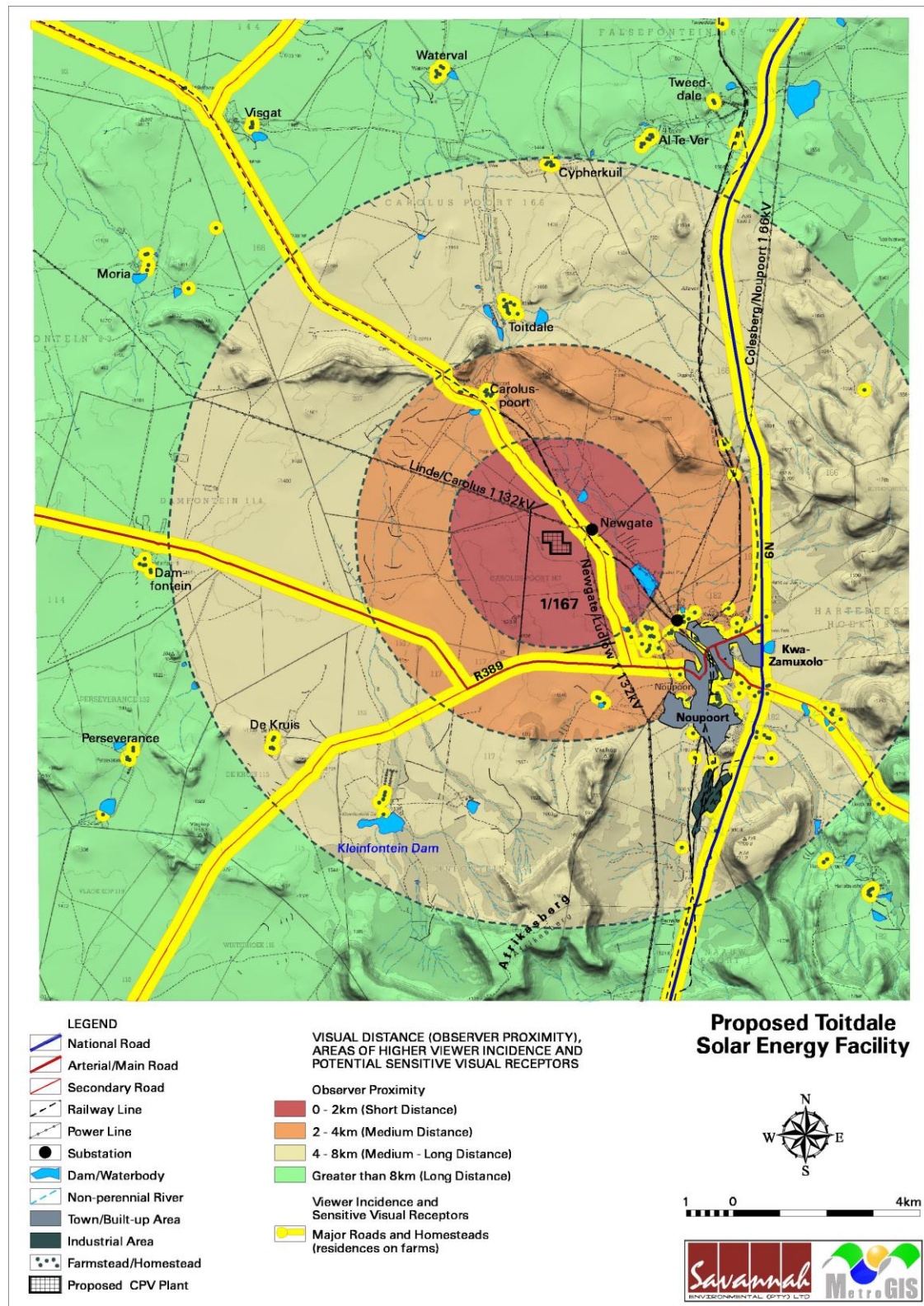


Figure 8: Observer proximity, areas of high viewer incidence and potential sensitive visual receptors

Visual impact index

Refer to Figure 9 for the visual impact index which shows the combined results of the visual exposure, viewer incidence / perception and visual distance of the proposed solar energy facility. An area with short distance, a potential visual exposure to the proposed facility, a high viewer incidence and a predominantly negative perception would therefore have a higher value (greater impact) on the index. This helps in focussing the attention to the critical areas of potential impact when evaluating the issues related to the visual impact.

- » Within the 2 km radius, sensitive visual receptors may experience potentially high visual impact. Receptors using the secondary road running past the Newgate substation to Caroluspoort will experience a very high visual impact. So too will commuters on a short section of the R389 to the south of the facility.
- » Within a 4 km radius, areas of potentially moderate visual impact include sections of the R389 and the secondary road running past the Newgate substation to Caroluspoort. The northern and southern parts but especially the western sections of this zone include undulating hills, which effectively screen large areas beyond them. It is therefore primarily the areas to the south east, west and north east that are likely to experience visual impact.
- » Between the 4 km and 8 km radius, the extent of potential visual impact decreases somewhat. Visually exposed areas lie primarily to the west, east, and to a lesser extent to the south and north. These areas are likely to be exposed to potentially low visual impact. Short stretches of the N9 in the east are likely to be exposed to potentially low visual impact. In addition, a number of homesteads / settlements may be exposed to low visual impact. These include De Kruis; Kwa-Zamuxolo; Cypherkuil; and Toitdale. The south eastern outskirts of Noupoot lie within this zone, but potential visual impact is expected to be low, where this occurs at all. This is due to the high VAC within the urban area.
- » Outside a radius of 8 km from the site, the magnitude of visual impact is mostly reduced to very low. Visually exposed areas are patchy and interrupted, and lie mainly to the south, east and north east of Noupoot.

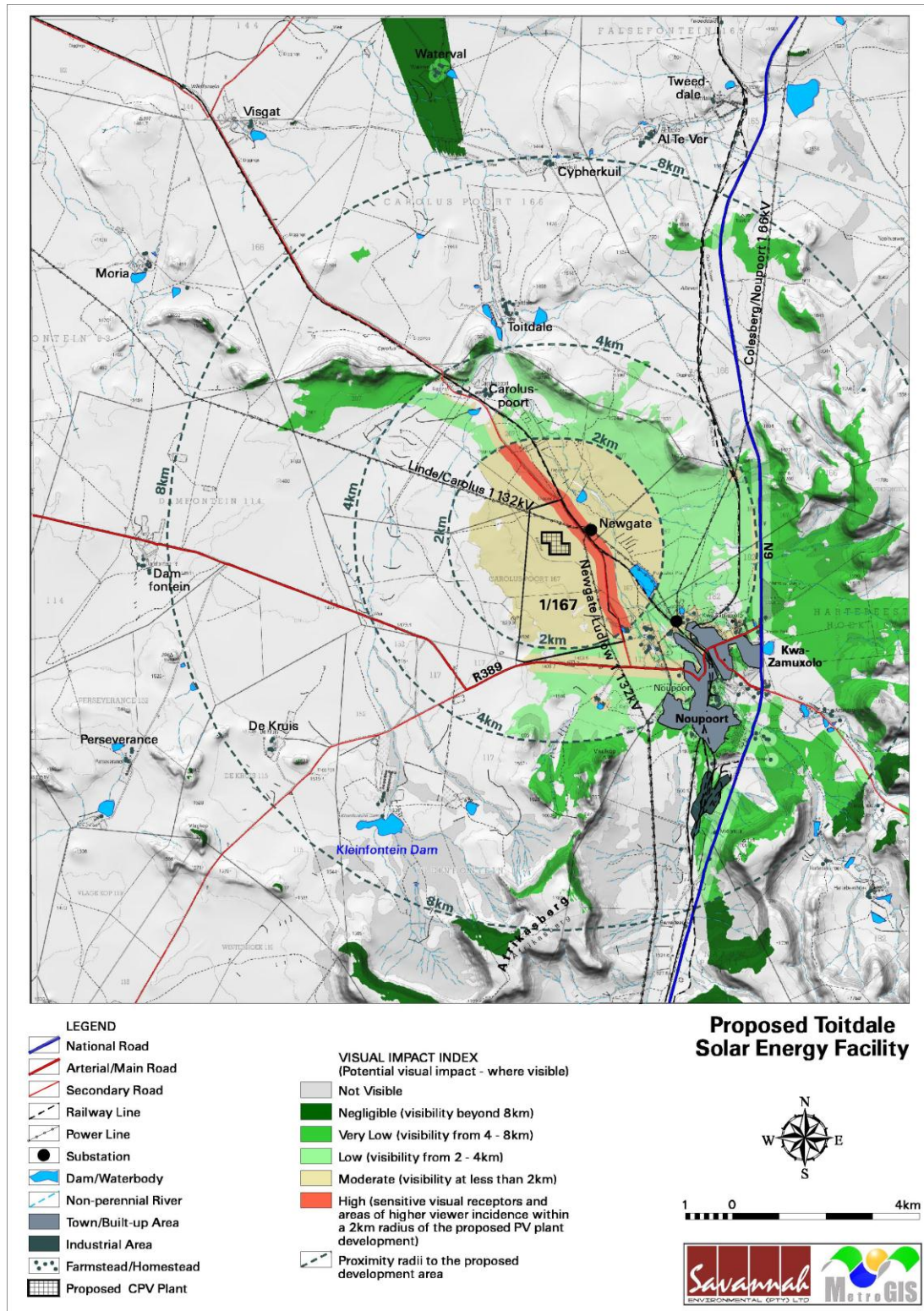


Figure 9: Visual impact index

Nature: Potential visual impact on users of main roads in close proximity to the proposed solar energy facility

Visual impacts on users of the secondary road running past the Newgate Substation to Caroluspoort, within a radius of 2 km of the proposed facility are expected to be of high significance, both before and after mitigation. So too will visual impacts on a short section of the R389 to the south of the facility.

	Without mitigation	With mitigation
Extent	Local (4)	Local (4)
Duration	Long term (4)	Long term (4)
Magnitude	High (8)	High (8)
Probability	High (4)	Improbable (2)
Significance	High (64)	Moderate (32)
Status (positive or negative)		
	Negative	
Reversibility		
	Recoverable (3)	
Irreplaceable loss of resources?		
	No	
Can impact be mitigated?		
	Yes	
Mitigation measures:		
Planning:		
» Retain and maintain natural vegetation in all areas outside of the development footprint.		
Cumulative impact:		
» The construction of the solar energy facility and its ancillary infrastructure will increase the cumulative visual impact of industrial type infrastructure within the region. This is relevant in light of the electricity related infrastructure within the region (i.e. the power lines and the Newgate Substation).		
Residual impact:		
» The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.		

Nature: Potential visual impact on commuters and tourists travelling by rail in close proximity to the proposed solar energy facility.

Commuters and tourists that are travelling by rail, and especially those travelling by luxury coach, may be impacted upon within a radius of 2 km of the proposed facility. The visual context of the site in close proximity to Noupoort is of relevance, and as such will reduce the probability of this impact occurring.

	Without mitigation	With mitigation
Extent	Local (4)	Local (4)
Duration	Long term (4)	Long term (4)
Magnitude	High (8)	Moderate (6)
Probability	Improbable (2)	Improbable (2)
Significance	Moderate (32)	Low (28)
Status (positive or negative)		
	Negative	
Reversibility		
	Recoverable (3)	
Irreplaceable loss of resources?		
	No	

Can impact be mitigated?	Yes
Mitigation measures:	
<u>Planning:</u>	
» Retain and maintain natural vegetation in all areas outside of the development footprint.	
Cumulative impact:	
» The construction of the solar energy facility and its ancillary infrastructure will increase the cumulative visual impact of industrial type infrastructure within the region. This is relevant in light of the electricity related infrastructure within the region (i.e. the power lines and the Newgate Substation).	
Residual impact:	
» The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.	

Nature: Potential visual impact on sensitive visual receptors (users of roads and residents of smallholdings, farms, and homesteads) within the region.		
The visual impact users of main roads (i.e. the N9 and the R389), secondary roads and residents of homesteads and settlements within the region beyond the 2 km radius, is expected to be of moderate significance, both before and after mitigation.		
	Without mitigation	With mitigation
Extent	Local (4)	Local (4)
Duration	Long term (4)	Long term (4)
Magnitude	High (8)	Moderate (6)
Probability	Improbable (2)	Improbable (2)
Significance	Moderate (32)	Low (28)
Status (positive or negative)		
Negative		
Reversibility		
Recoverable (3)		
Irreplaceable loss of resources?		
No		
Can impact be mitigated?		
Yes		
Mitigation:		
<u>Planning:</u>		
» Retain and maintain natural vegetation in all areas outside of the development footprint.		
Cumulative impact:		
» The construction of the solar energy facility and its ancillary infrastructure will increase the cumulative visual impact of industrial type infrastructure within the region. This is relevant in light of the electricity related infrastructure within the region (i.e. the power lines and the Newgate Substation).		
Residual impact:		
» The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.		

Nature: Potential visual impact on residents of built up and urban centres within the region		
The visual impact on residents of Noupoort is expected to be of low significance, both before and after mitigation. The VAC of this urban area reduces the probability of this impact occurring.		
	Without mitigation	With mitigation
Extent	Local (4)	Local (4)
Duration	Long term (4)	Long term (4)
Magnitude	High (8)	Moderate (6)
Probability	Improbable (2)	Improbable (2)
Significance	Moderate (32)	Low (28)
Status (positive or negative)		
	Negative	
Reversibility		
	Recoverable (3)	
Irreplaceable loss of resources?		
	No	
Can impact be mitigated?		
	Yes	
Mitigation:		
<u>Planning:</u>		
» Retain and maintain natural vegetation in all areas outside of the development footprint.		
Cumulative impact:		
» The construction of the solar energy facility and its ancillary infrastructure will increase the cumulative visual impact of industrial type infrastructure within the region. This is relevant in light of the electricity related infrastructure within the region (i.e. the power lines and the Newgate Substation).		
Residual impact:		
» The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.		

Nature: Potential visual impact of the access roads and ancillary infrastructure on observers in close proximity to the proposed solar energy facility		
The construction of the on-site switch-gear, the access roads, the workshops and the storage areas could represent a visual impact. Although no dedicated viewshed has been generated for the above infrastructure, it will all be located within the proposed solar energy facility footprint, and will thus lie within that of the primary infrastructure.		
The anticipated visual impact resulting from this infrastructure is likely to be of low significance both before and after mitigation. The presence of the CPV panels (i.e. the primary impact) will result in some absorption of this impact, thus reducing the probability of the impact occurring.		
	Without mitigation	With mitigation
Extent	Local (4)	Local (4)
Duration	Long term (4)	Long term (4)
Magnitude	High (8)	Moderate (6)
Probability	Improbable (2)	Improbable (2)
Significance	Moderate (32)	Low (28)

Status (positive or negative)	Negative
Reversibility	Recoverable (3)
Irreplaceable loss of resources?	No
Can impact be mitigated?	Yes
Mitigation:	
<u>Planning:</u>	
<ul style="list-style-type: none"> » Plan internal roads and ancillary infrastructure in such a way and in such a location that clearing of vegetation is minimised. Consolidate existing infrastructure as much as possible, and make use of already disturbed areas rather than pristine sites wherever possible. » Retain and maintain natural vegetation in all areas outside of the development footprint. 	
<u>Construction:</u>	
<ul style="list-style-type: none"> » Rehabilitation of all construction areas. » Ensure that vegetation is not cleared unnecessarily to make way for the access road and ancillary buildings. 	
Cumulative impact:	
<ul style="list-style-type: none"> » The construction of the solar energy facility and its ancillary infrastructure will increase the cumulative visual impact of industrial type infrastructure within the region. This is relevant in light of the electricity related infrastructure within the region (i.e. the power lines and the Newgate Substation). 	
Residual impact:	
<ul style="list-style-type: none"> » The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain. 	

Nature: Potential visual impact of the proposed facility on the visual character of the landscape and the sense of place of the region

Sense of place refers to a unique experience of an environment by a user, based on his / her cognitive experience of the place. Visual criteria and specifically the visual character of an area (informed by a combination of aspects such as topography, level of development, vegetation, noteworthy features, cultural / historical features, etc.) play a significant role.

A visual impact on the sense of place is one that alters the visual landscape to such an extent that the user experiences the environment differently, and more specifically, in a less appealing or less positive light.

Despite the presence of some industrial type infrastructure in and around the town of Noupoot, the greater landscape of the study area is characterised by wide-open spaces and little development. However, the proximity of the proposed facility to Noupoot, the Newgate Substation and other electrical infrastructure has relevance, and as such reduces the probability of this impact occurring.

	<i>Without mitigation</i>	<i>With mitigation</i>
<i>Extent</i>	Regional (3)	Regional (3)
<i>Duration</i>	Long term (4)	Long term (4)

Magnitude	Low (4)	Low (4)
Probability	Improbable (2)	Improbable (2)
Significance	Low (22)	Low (22)
Status (positive or negative)		
	Negative	
Reversibility		
	Recoverable (3)	
Irreplaceable loss of resources?		
	No	
Can impact be mitigated?		
	Yes	
Mitigation measures:		
<u>Planning:</u>		
» Retain and maintain natural vegetation in all areas outside of the development footprint.		
Cumulative impact:		
» The construction of the solar energy facility and its ancillary infrastructure will increase the cumulative visual impact of industrial type infrastructure within the region. This is relevant in light of the electricity related infrastructure within the region (i.e. the power lines and the Newgate Substation).		
Residual impact:		
» The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.		

Nature: Potential visual impact of the proposed facility on tourist access routes (the N9) within the region		
The anticipated visual impact of the facility on the N9, which is a recognised national tourist access route, is expected to be of low significance, both before and after mitigation.		
	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Low (4)
Probability	Improbable (2)	Improbable (2)
Significance	Low (22)	Low (22)
Status (positive or negative)		
	Negative	
Reversibility		
	Recoverable (3)	
Irreplaceable loss of resources?		
	No	
Can impact be mitigated?		
	Yes	
Mitigation measures:		
<u>Planning:</u>		
» Retain and maintain natural vegetation in all areas outside of the development footprint.		
Residual impact:		
» The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.		
Cumulative impact:		
» The construction of the solar energy facility and its ancillary infrastructure will		

increase the cumulative visual impact of industrial type infrastructure within the region. This is relevant in light of the electricity related infrastructure within the region (i.e. the power lines and the Newgate Substation).

Impacts on the socio-economic environment

Nature: Job creation

Approximately 2 permanent and 12 semi-permanent workers are expected to be required on-site of which the latter will be low skilled positions required to clean the panels (once every 3 months).

	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Very short (2) *	Very short (2) *
Magnitude	Minor (2)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Low (15)	Low (21)
Status (positive or negative)	Positive	
Reversibility	N/A	
Irreplaceable loss of resources?	N/A	
Can impact be mitigated?	Yes	
Mitigation measures:		
» Maximise the use of local labour for low – semi skilled jobs far as possible.		
Cumulative impact:		
» The development of additional renewable energy facilities in the region may serve to increase the potential for job creation.		
Residual impact:		
» None expected.		

No Go Alternative

Also referred to as the 'Do-nothing' option, this refers to Toitdale Solar Energy not operating the proposed PV facility. In this scenario the potential environmental and social impacts will not occur and the status quo will be maintained. However, should the project not proceed, the distributed approach regarding the government target for renewable energy will not be realised. As a result the distributed range of socio-economic and environmental benefits for South Africa would not be realised.

2.4. IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING PHASE

Alternative (preferred alternative)

The impacts during the decommissioning and closure phases will be similar to impacts of the construction phase as discussed above.

No Go Alternative (Compulsory)

The 'Do nothing' alternative is the option of not decommissioning the proposed solar energy facility at the end of its life span.

At the end of its life span the efficiency of the facility could be reduced such that less electricity is produced. However, the additional electricity that could continue to be evacuated into the Eskom grid would be beneficial to the area. In addition, implementation of this alternative would mean that job opportunities are not lost.

3. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity 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.

This section provides a summary of the assessment and conclusions drawn for the proposed solar energy facility. In doing so, it draws on the information gathered as part of the Basic Assessment process and the knowledge gained by the environmental consultants during the course of the process and presents an informed opinion of the environmental impacts associated with the proposed project.

The overall impact on **ecology** is likely to be of **low significance** given the implementation of mitigation measures. Arid site development generally poses several problems mainly due to the absence of water. These ecosystems are typically old and any disturbance requires long periods of recovery. In the area of the proposed development the main threats posed by this development concerns a minor and localised loss of habitat and the associated loss of biodiversity. Due to this vegetation type being so extensive this does however represent a very small percentage of the available habitat and is highly unlikely to have any effects on population trends of fauna that occur here. Developers should however take care to minimise disturbance to sediment and boulders as these represent prime areas for reptiles to occur in. Most of the plant and animal species present where listed as least concern and therefore most of these species have stable populations and are widespread species. A small percentage of plants species (i.e. *Marasmodes undulata*), mammals (i.e. Straw Coloured Fruit Bat) and birds (i.e. Grey Crowned Crane, Blue Crane) are listed species and are therefore of concern. It is however important to note that given the small scale of the proposed development, the overall impact on populations of these species is likely to be very small.

The overall impact on **soil and agricultural potential** is likely to be of **low to moderate significance** with the implementation of the recommended mitigation measures. The proposed development will not have large impacts due to the low agricultural potential of the site. The potential exists to increase the grazing potential of the site through additional shade provided by the solar panels as well as the harvesting of rainwater on the site through the use of dedicated storm water mitigation and management measures. However, erosion is considered to be a large risk and it must be controlled through adequate mitigation and control structures. Furthermore impacts from vehicles, such as spillages of oil and hydrocarbons, should be prevented and mitigated. Lastly dust generation on site should be mitigated and minimised as the dust can negatively affect the quality the surrounding environment and can contribute to dust loads from

surrounding land uses. The impacts on the site need to be viewed in relation to the opencast mining of coal in areas of high potential soils – such as the Eastern Highveld. With this comparison in mind the impact of a solar energy facility is negligible compared to the damaging impacts of coal mining – for a similar energy output. Therefore, in perspective, the impacts of the proposed facility can be motivated as necessary in decreasing the impacts in areas where agriculture potential plays a more significant role.

The overall **heritage** impact is likely to be of **high - moderate significance** with the implementation of mitigation measures. No archaeological sites with any depth of deposit or associated material and organic remains were identified within the area proposed for development. The proposed focus area for the construction of the solar facility and associated infrastructure is of a low cultural sensitivity. A professional archaeologist (with an already authorised collection permit) must be appointed during the various phases of development including vegetation clearing and the excavation activities to monitor and identify possible archaeological material remains and features that may occur below the surface and further make appropriate recommendations on removing and / or protecting the archaeological material remains and features. If concentrations of archaeological heritage material and human remains are uncovered during construction, all work must cease immediately and be reported to the Albany Museum (046 622 2312) and/or the South African Heritage Resources Agency (SAHRA) (021 642 4502) so that systematic and professional investigation/ excavation can be undertaken. Construction managers/foremen must be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.

The overall visual impact is likely to be of a predominantly **low - moderate significance**. The construction and operational phases will have a visual impact on the visual environment especially within, but not limited to the area within 2 km of the proposed facility. The facility has an advantage over other more conventional power generating plants (e.g. coal-fired power stations). The facility utilises a renewable source of energy (considered as an international priority) to generate power and is therefore generally perceived in a more favourable light. It does not emit any harmful by-products or pollutants and is therefore not negatively associated with possible health risks to observers.

The establishment of the facility will have positive benefits as the integration of an additional 10 MW may alleviate the pressure on the local grid to a small extent and would contribute (albeit small) to the national target for renewable energy. Therefore, based on the findings of the studies undertaken, in terms of environmental constraints identified through the initial Environmental Basic Assessment process, no environmental fatal flaws were identified with the establishment of the proposed Kleinfontein Solar Energy Facility and associated infrastructure. Therefore, it is recommended that the project should be authorised. However, a number of issues requiring mitigation have been highlighted. Environmental specifications for the management of these issues / impacts are detailed within the draft Environmental Management Programme (EMP).

No Go Alternative (Compulsory)

Also referred to as the 'Do nothing' option, this refers to Toitdale Solar Energy Resources

not constructing their proposed solar energy facility on the identified site near Noupoort. In this scenario the potential positive and negative environmental and social impacts as described in this Basic Assessment Report will not occur and the status quo will be maintained.

Should the project not proceed, the contribution of up to 10 MW from this project towards the Government target for **renewable energy** will not be realised. As a result the potential local and regional socio-economic and environmental benefits expected to be associated with the proposed project would not be realised. These include:

- » *Increased energy security:* The current electricity crisis in South Africa highlights the significant role that renewable energy can play in terms of power supplementation. In addition, given that renewables can often be deployed in a decentralised manner close to consumers, they offer the opportunity for improving grid strength and supply quality, while reducing expensive transmission and distribution losses. In addition the proposed facility will increase electricity security for the local Maropong Township during the day.
- » *Exploitation of our significant renewable energy resource:* At present, valuable national resources including biomass by-products, solar radiation and wind power remain largely unexploited. The use of these energy flows will strengthen energy security through the development of a diverse energy portfolio.
- » *Pollution reduction:* The releases of by-products through the burning of fossil fuels for electricity generation have a particularly hazardous impact on human health and contribute to ecosystem degradation.
- » *Support for international agreements:* The effective deployment of renewable energy provides a tangible means for South Africa to demonstrate its commitment to its international agreements under the Kyoto Protocol, and for cementing its status as a leading player within the international community.
- » *Employment creation:* The sale, development, installation, maintenance, and management of renewable energy facilities have significant potential for job creation in South Africa.
- » *Acceptability to society:* Renewable energy offers a number of tangible benefits to society including reduced pollution concerns, improved human, and ecosystem health.
- » *Support to a new industry sector:* The development of renewable energy offers the opportunity to establish a new industry within the South African economy.
- » *Support to local community:* Since the local community will acquire some ownership in the facility, some of the revenue generated by the facility will be utilised for upliftment of the local community.

Within a policy framework, the development of renewable energy in South Africa is supported by the White Paper on Renewable Energy (November 2003), which has set a

target of 10 000 GWh renewable energy contributions to final energy consumption by 2013. The target is to be achieved primarily through the development of solar, biomass, solar and small-scale hydro.

The 'Do nothing' alternative will not assist the South African government in addressing climate change, in reaching the set targets for renewable energy, nor will it assist in supplying the increasing electricity demand within the country. The 'Do nothing' alternative is, therefore, not a preferred alternative.

SECTION E: 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)?

YES <input type="checkbox"/>	
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If "NO," indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment):

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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 construction of the proposed solar energy facility should be implemented according to the EMP to adequately mitigate and manage potential impacts associated with construction activities. The construction activities and relevant rehabilitation of disturbed areas should be monitored against the approved EMP, the Environmental Authorisation and all other relevant environmental legislation. Relevant conditions to be adhered to include:

Design, Construction, and Decommissioning Phases:

The mitigation and management measures previously listed in this Basic Assessment Report should be implemented in order to minimise potential environmental impacts. The following generic mitigation measures should also be implemented.

- » Contractors must be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites. A professional archaeologist must be appointed during construction to monitor various activities including vegetation clearing and excavation activities to monitor and identify possible archaeological material remains and features that may occur below the surface. If concentrations of archaeological heritage material and human remains are uncovered, all work must cease immediately and be reported to the Albany Museum and/or SAHRA so that systematic and professional investigation/ excavation can be undertaken.
- » An application for all permits with respect to protected tree species or protected plant species need to be submitted to the relevant authority prior to the commencement of construction activities.
- » All declared aliens must be identified and managed in accordance with the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983), the implementation of a monitoring programme in this regard is recommended.
- » Before development can continue the regions need to be checked for the presence of bird nesting sites, particularly those of ground nesting species.
- » The site should be inspected for the presence of burrows and areas of high activity for small rodents (e.g. burrows, small animal pathways) and these areas identified and preferably avoided in terms of development.
- » Areas of prime reptile habitat (e.g. extensive areas of flat rock, boulders fields) should be avoided. Reptiles present on the study site could potentially also be trapped and

translocated.

- » Limit construction, maintenance, and inspection activities to dry periods.
- » Develop emergency maintenance operational plan to deal with any event of contamination, pollution, or spillages, particularly in riparian areas.
- » If large areas are cleared for the storage of equipment, these could be rehabilitated using arid site rehabilitation techniques such as planting cover crops reseeding with local grasses and shrubs.
- » Compile a detailed waste management plan
- » Compile a storm water management plan.

Operation Phase:

The mitigation and management measures previously listed in this Basic Assessment Report should be implemented in order to minimise potential environmental impacts. The following generic mitigation measures should also be implemented.

- » Maintenance of erosion control measures (i.e. berms).
- » Development and implementation of a storm water management plan.

Is an EMPR attached?

YES ✓

The EMPR must be attached as **Appendix F**.