

**ENVIRONMENTAL IMPACT ASSESSMENT PROCESS  
FINAL BASIC ASSESSMENT REPORT**

**PROPOSED WONDERHEUWEL SOLAR ENERGY FACILITY  
NEAR NOUPOORT, NORTHERN CAPE PROVINCE**

**(DEA REF No: 14/12/16/3/3/1/731)**

**FINAL BASIC ASSESSMENT REPORT  
FOR THE DEPARTMENT OF ENVIRONMENTAL AFFAIRS  
DECEMBER 2012**

**Prepared for:**

Wonderheuwel Solar Energy (Pty) Ltd  
P O Box 2505,  
Sunninghill West  
2072

**Prepared by:**

*Savannah Environmental Pty Ltd*

FIRST FLOOR, BLOCK 2  
5 WOODLANDS DRIVE OFFICE PARK  
CNR WOODLANDS DRIVE &  
WESTERN SERVICE ROAD,  
WOODMEAD, GAUTENG  
P.O. BOX 148, SUNNINGHILL, 2157  
TELEPHONE: +27 (0)11 656 3237  
FACSIMILE : +27 (0)86 684 0547  
EMAIL : INFO@SAVANNAHSA.COM  
WWW.SAVANNAHSA.COM





# BASIC ASSESSMENT REPORT



## 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. This report format is current as of **1 December 2012**. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority
3. 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.
4. Where applicable **tick** the boxes that are applicable in the report.
5. An incomplete report may be returned to the applicant for revision.
6. 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.
7. This report must be handed in at offices of the relevant competent authority as determined by each authority.
8. No faxed or e-mailed reports will be accepted.
9. The signature of the EAP on the report must be an original signature.
10. The report must be compiled by an independent environmental assessment practitioner.
11. 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.
12. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
13. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.
14. Two (2) colour hard copies and one (1) electronic copy of the report must be submitted to the competent authority.
15. Shape files (.shp) for maps must be included on the electronic copy of the report submitted to the competent authority.

## PROJECT DETAILS

---

- DEA Reference No.** : 14/12/16/3/3/1/731
- Title** : Environmental Basic Assessment Process  
Final Basic Assessment Report: Proposed  
Wonderheuwel Solar Energy Facility on a site near  
Noupoort, Northern Cape Province.
- Authors** : Savannah Environmental  
Karen Jodas  
Sheila Muniongo  
Ravisha Ajodhapersadh  
Gabrielle Wood
- Sub-consultants** : Eduplan cc  
Zone Land Solutions  
Skarab cc  
Albany Museum  
Wildskies Ecological Services
- Client** : Wonderheuwel Solar Energy (Pty) Ltd
- Report Status** : Final Basic Assessment Report for submission to  
the Department of Environmental Affairs
- Submission Date** : 18 December 2012

**When used as a reference this report should be cited as:** Savannah Environmental (2012)  
Final Basic Assessment Report: Proposed Wonderheuwel Solar Energy Facility on a site near  
Noupoort, Northern Cape Province.

**COPYRIGHT RESERVED**

This technical report has been produced for Wonderheuwel Solar Energy (Pty) Ltd. The intellectual property contained in this report remains vested in Savannah Environmental and Wonderheuwel Solar Energy (Pty) Ltd. No part of the report may be reproduced in any manner without written permission from Wonderheuwel Solar Energy (Pty) Ltd or Savannah Environmental (Pty) Ltd.

## TABLE OF CONTENTS

<b>PROJECT DETAILS</b> .....	<b>iv</b>
<b>TABLE OF CONTENTS</b> .....	<b>v</b>
<b>APPENDICES</b> .....	<b>vii</b>
<b>SUMMARY AND OVERVIEW OF THE PROPOSED PROJECT</b> .....	<b>1</b>
1.1 Summary of the Proposed Development .....	5
1.2 Requirement for an Environmental Impact Assessment Process .....	6
1.3 Details of Environmental Assessment Practitioner and Expertise to conduct the BASIC ASSESSMENT PROCESS .....	8
<b>SECTION A: ACTIVITY INFORMATION</b> .....	<b>10</b>
1. Project DESCRIPTION .....	10
<i>Describe the project associated with the listed activities applied for</i> .....	10
<b>a) Conduct Surveys</b> .....	12
<b>b) Establishment of Access Roads to the Site</b> .....	12
<b>c) Undertake Site Preparation</b> .....	13
<b>d) Transport of Components and Equipment to Site</b> .....	13
<b>e) Establishment of Laydown Areas on Site</b> .....	13
<b>f) Erect PV Cells and Construct Substation &amp; Inverters</b> .....	13
<b>g) Establishment of Ancillary Infrastructure (Power line, on site substation and office)</b> .....	13
<b>h) Undertake Site Rehabilitation</b> .....	14
<b>1.3 Operation Phase</b> .....	14
<b>1.4 Decommissioning Phase</b> .....	14
<b>a) Site Preparation</b> .....	15
<b>b) Disassemble Components</b> .....	15
<i>Provide a detailed description of the listed activities associated with the project as applied for</i> .....	15
2. FEASIBLE AND REASONABLE ALTERNATIVES .....	16
a) Site alternatives.....	17
b) Lay-out alternatives.....	18
c) Technology alternatives.....	19
d) Other alternatives (e.g. scheduling, demand, input, scale and design alternatives) ...	20
e) No-go alternative .....	20
3. Physical size of the activity .....	21
a) Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):.....	21
b) Indicate the size of the alternative sites or servitudes (within which the above footprints will occur): .....	21
4. Site Access .....	21
5. LOCALITY MAP .....	22
6. LAYOUT/ROUTE PLAN .....	22
7. Sensitivity map .....	23
8. Site PHOTOGRAPHS .....	23
9. FACILITY ILLUSTRATION.....	24
10. ACTIVITY MOTIVATION.....	24
11. Applicable legislation, policies and/or guidelines .....	31
12. Waste, effluent, emission and noise management.....	43

a) Solid waste management.....	43
b) Liquid effluent.....	44
c) Emissions into the atmosphere .....	45
d) Waste permit.....	45
e) Generation of noise .....	45
13. WATER USE .....	45
14. ENERGY EFFICIENCY .....	46
<b>SECTION B: SITE/AREA/PROPERTY DESCRIPTION.....</b>	<b>47</b>
1. GRADIENT OF THE SITE.....	48
2. location in landscape .....	48
3. Groundwater, Soil and Geological stability of the site.....	48
4. Groundcover.....	49
5. SURFACE WATER.....	52
6. Land use character of surrounding area .....	52
7. Cultural/Historical Features .....	53
8. SOCIO-ECONOMIC CHARACTER.....	54
a) Local Municipality.....	54
b) Socio-economic value of the activity.....	56
9. Biodiversity.....	56
a) Indicate the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category).....	57
c) Complete the table to indicate:.....	58
d) Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats).....	59
<b>SECTION C: PUBLIC PARTICIPATION.....</b>	<b>60</b>
1. ADVERTISEMENT and NoticeS.....	60
2. Determination of appropriate measures .....	60
3. Issues raised by interested and affected parties .....	61
4. Comments and response report.....	62
5. AUTHORITY PARTICIPATION .....	62
6. CONSULTATION WITH OTHER STAKEHOLDERS .....	66
<b>SECTION D: IMPACT ASSESSMENT.....</b>	<b>67</b>
1. Impacts that may result from the planning and design, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE phaseS AS WELL AS PROPOSED MANAGEMENT OF identified IMPACTS AND PROPOSED mitigation measures .....	67
2. Environmental impact statement .....	79
<b>SECTION E: RECOMMENDATION OF PRACTITIONER.....</b>	<b>84</b>
<b>SECTION F: APPENDICES .....</b>	<b>90</b>

## APPENDICES

---

**Appendix A:** Site Plan(s)

**Appendix B:** Photographic Record

**Appendix C:** Facility Illustration(s)

**Appendix D:** Specialist Reports

» *Appendix D1: Ecology Study*

» *Appendix D2: Heritage Study*

» *Appendix D3: Palaeontology Study*

» *Appendix D4: Soils, Land Use, Land Capability and Agricultural Potential Study*

» *Appendix D5: Visual Study*

» *Appendix D6: Avifaunal Study*

**Appendix E:** Record of Public Involvement Process

» *Appendix E1: Advert & site notices*

» *Appendix E2: Key stakeholders correspondence*

» *Appendix E3: Comments and response report (CRR)*

» *Appendix E4: Authority & Organ of states correspondence*

» *Appendix E5: Database*

» *Appendix E6: Minutes of Meetings*

» *Appendix E7: Landowners Map*

**Appendix F:** Impact Assessment

**Appendix G:** Environmental Management Programme (EMPr)

**Appendix H:** Details of EAP and expertise

**Appendix I:** Specialist's declaration of interest

**Appendix J:** Other Information

» *J1: List of Co-ordinates for Power Line*

## **PUBLIC REVIEW PERIOD FOR THE DRAFT BASIC ASSESSMENT REPORT**

A Draft Basic Assessment Report was made available for public review at the following places, which lie in the vicinity of the proposed project area from **12 November 2012 – 12 December 2012:**

» Noupoot Public Library

The report was also available for download on:

» [www.savannahsa.com](http://www.savannahsa.com)



---

## **SUMMARY AND OVERVIEW OF THE PROPOSED PROJECT**

---

Due to the exploitation of and large scale reliance on non-renewable resources and the potential subsequent impacts on climate, there is increasing pressure globally to increase the share of renewable energy generation. 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, require refurbishment, or have been recently returned to service (re-commissioned) at great expense (i.e. the Camden, Komati, and Grootvlei Power Stations).

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 PV or CPV technology). The proposed project is to contribute towards this goal for renewable energy.

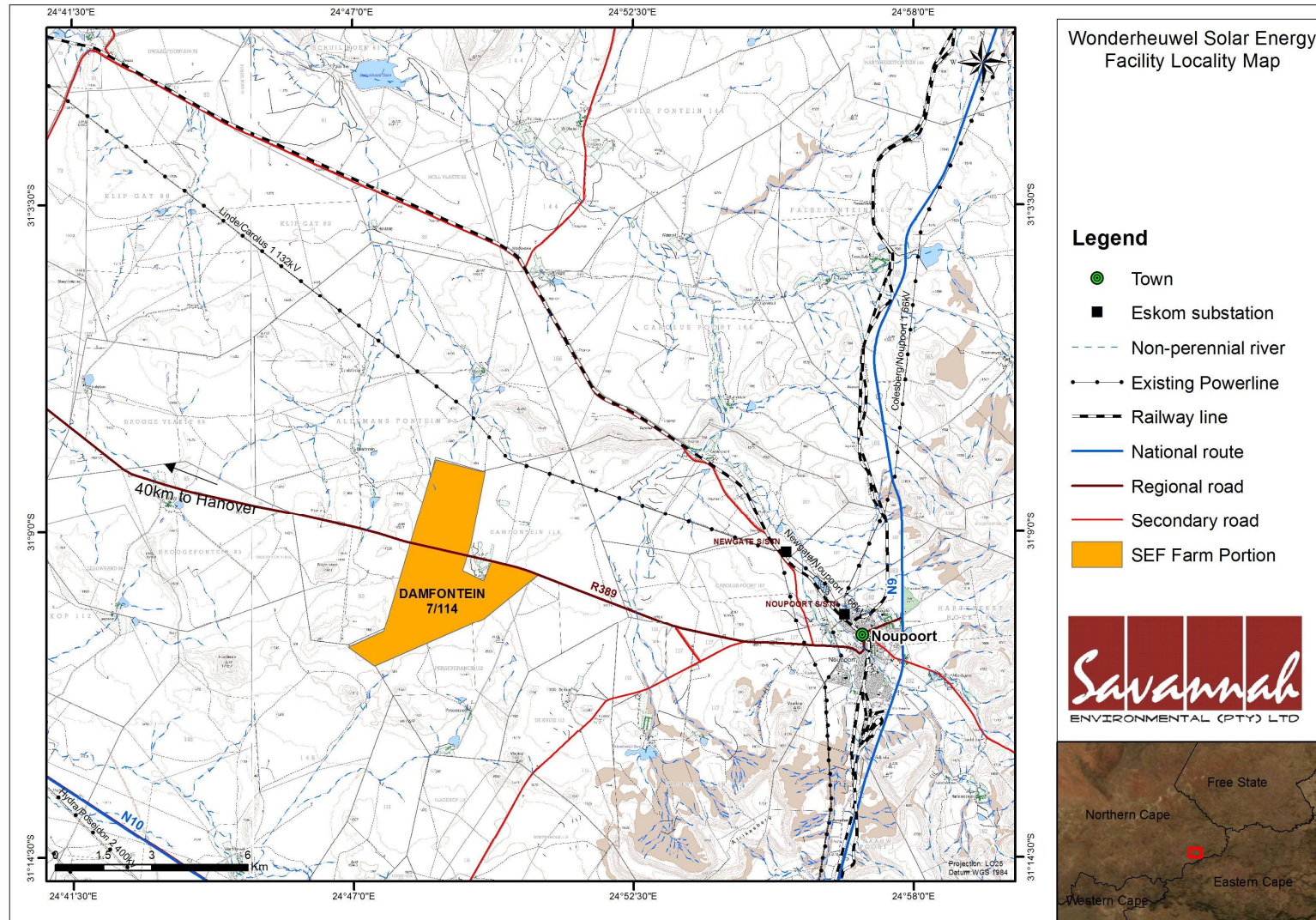
The purpose of the proposed facility is to generate and sell the electricity generated to Eskom as part of the Renewable Energy Independent Power Producers (IPP) Procurement Programme. The IPP Procurement Programme has been introduced by the Department of Energy (DoE) to promote the development of renewable 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, as well as providing the opportunity for the South African Government to introduce renewable energy into the power generation technology mix within the country, as per the aims of the Integrated Resource Plan (IRP) for the period 2010 – 2030.

Wonderheuvel Solar Energy (Pty) Ltd is proposing the establishment of a commercial solar energy facility (using photovoltaic technology) for electricity generation of up to 20 MW in capacity. The facility is proposed on Portion 7 of Farm Damfontein 114 which is located approximately 15 km north west of Noupoot in the Northern Cape Province of South Africa (refer to Figure 1). The propose location of the PV facility on Portion 7 of

Farm Damfontein 114 is shown in Figure 2. This site has been identified for consideration and evaluation through a Basic Environmental Assessment process.

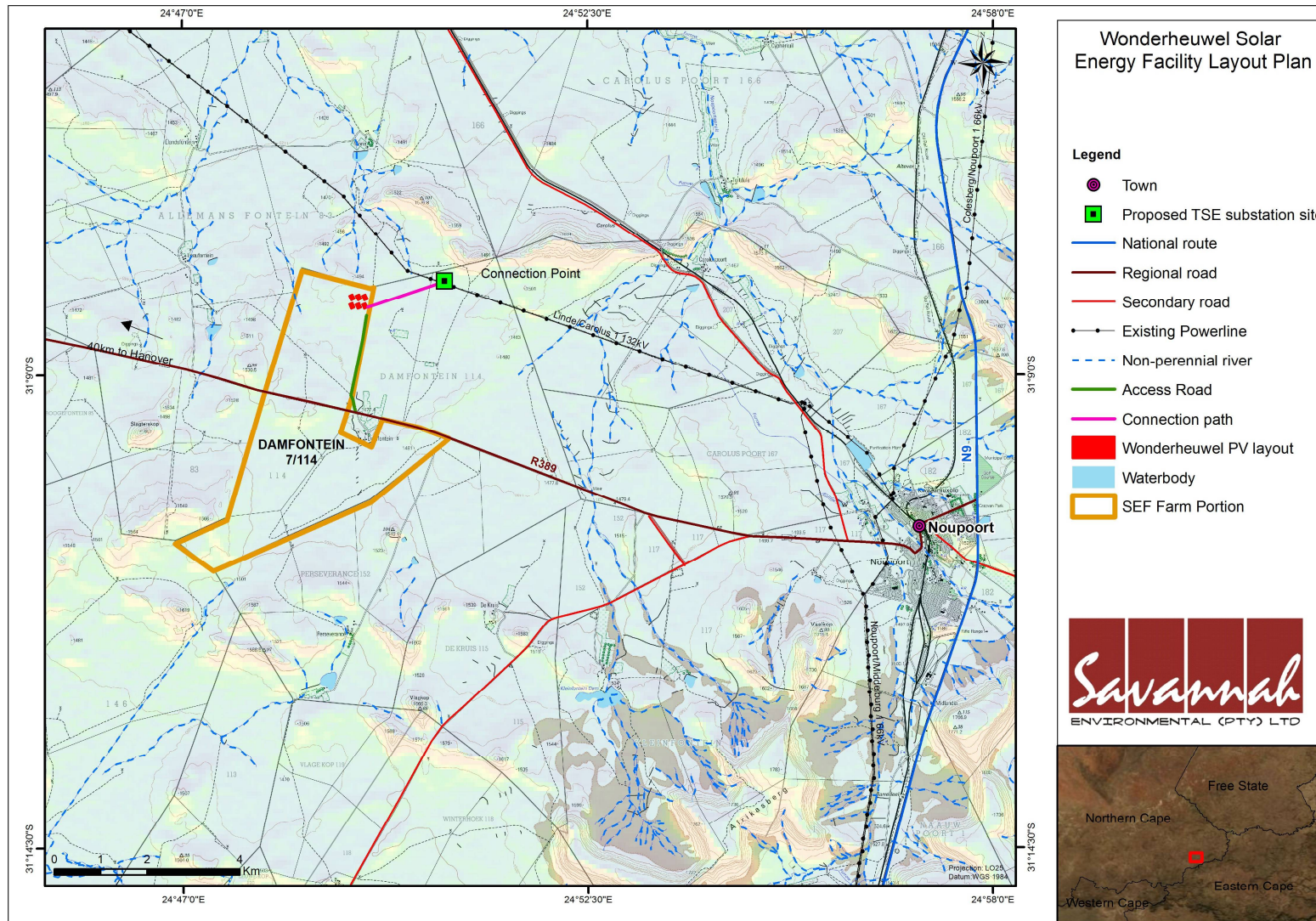
In terms of the Environmental Impact Assessment (EIA) Regulations published in terms of Section 24(5) of the National Environmental Management Act (NEMA, Act No. 107 of 1998), Wonderheuwel Solar Energy (Pty) requires authorisation from the National Department of Environmental Affairs (DEA) (in consultation with the Northern Cape Department of Environmental and Nature Conservation (NC-DENC)-for the construction and operation of the proposed Wonderheuwel Solar Energy Project. This project has been registered with the National DEA under application Reference Number **14/12/16/3/3/1/731**. 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 this proposed project. This is due to the fact that the facility development area covers an area of less than 20 hectares and the generation capacity of the facility is less than 20 MW. In order to obtain authorisation, comprehensive and independent environmental studies must be undertaken in accordance with the EIA Regulations.

Wonderheuwel Solar Energy (Pty) Ltd has appointed Savannah Environmental as the independent environmental consultants to undertake the required Basic Assessment and to identify and assess all the potential environmental impacts associated with the proposed project and propose appropriate mitigation and management measures in an Environmental Management Programme (EMP). As part of these environmental studies, I&APs have been actively involved through the public involvement process.



**Figure 1:** Locality map showing the development area for the proposed Wonderheuwel Solar Energy Facility





**Figure 2:** Layout of the proposed Wonderheuwel Solar Energy Facility and associated infrastructure on Portion 7 of Farm Damfontein 114

## 1.1 SUMMARY OF THE PROPOSED DEVELOPMENT

Wonderheuvel Solar Energy (Pty) Ltd is proposing the establishment of a commercial solar energy facility (using photovoltaic technology) for electricity generation of up to 20 MW in capacity. The facility is proposed on Portion 7 of Farm Damfontein 114 which is located approximately 15 km north west of Noupoort in the Northern Cape Province of South Africa (refer to Figure 1). This site has been identified for consideration and evaluation through a Basic Environmental Assessment process.

The site was selected by Wonderheuvel Solar Energy (Pty) Ltd for the development of a solar energy facility based on the annual direct solar irradiation values (a study of available radiation data shows that the proposed site is uniformly irradiated by the sun), suitable proximity in relation to the existing electricity grid available for evacuating the generated power, as well as no competitors/developers in the area of the proposed facility.

A layout and location for the facility has been determined by Wonderheuvel Solar Energy and was considered in this assessment (refer to Figure 2). The site is proposed on the far northern section of Portion 7 of Farm Damfontein 114.

The facility is expected to require an area of less than 20 ha in extent, within which the following infrastructure is proposed to be established:

- » Arrays of photovoltaic (PV) panels with a capacity of up to 20 MW;
- » Mounting structure to be either rammed steel piles or piles with pre-manufactured concrete footing to support the PV panels
- » Cabling between the project components, to be laid underground where practical;
- » Inverter/Transformer enclosures;
- » On site switching station and a new 66kV/132kV overhead power line of ~ 1700 m. Electricity generated will then be evacuated from this substation to the new TSE Substation located north-west of the Wonderheuvel site, a distance of 950m from the facility;
- » Internal access roads; fencing and workshop area for maintenance, storage and offices.

The proposed TSE 132 kV – 66 kV step-down substation is proposed on an adjacent property: Portion 8 of the Damfontein Farm 118, in order to connect the Wonderheuvel Solar Energy Facility to the Eskom grid. In addition, the TSE Substation is proposed to allow other solar energy facilities proposed by the same developer in the larger area to connect to the Eskom grid. *A separate basic assessment report has been compiled for the planned substation (referred to as the TSE substation under DEA Ref No: 14/12/16/3/3/1/732).* The developer will build the substation and thereafter hand it over to Eskom (who will then own, operate and maintain the substation). The developer

(under separate Special Purpose Vehicles (SPVs) is also proposing four other solar energy facilities on adjacent farm portions near Noupoort. These facilities are being considered within separate Basic Assessment processes under the following applications:

- » Damfontein Solar Energy Facility DEA REF NO.: 14/12/16/3/3/1/728
- » Proposed TSE Distribution Substation DEA REF NO.: 14/12/16/3/3/1/732
- » Allemans Solar Energy Facility DEA REF NO.: 14/12/16/3/3/1/730
- » Carolus Poort Solar Energy Facility DEA REF NO.: 14/12/16/3/3/1/729
- » Gilmer Solar Energy Facility DEA REF NO.: 14/12/16/3/3/1/735

## 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 Environmental and Nature Conservation (NC-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 R544 – R546 (as amended), 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 (the competent authority) under application reference number **14/12/16/3/3/1/731**.

In terms of sections 24 and 24D of NEMA, as read with the EIA Regulations of GNR543; GNR544; GNR545; and GNR546, the following 'listed activities' are triggered by the proposed solar facility include:

Notice Number	Activity	Description	Relevance of Regulation to Project
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 megawatts but less than 20 megawatts; or ii. The output is 10 megawatts or less but the total extent of the facility covers an area in excess of 1 hectare.	The proposed facility will have a generation capacity of ~ 20 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-	The facility will require the construction of a 66kV/132kV overhead distribution power line,

Notice Number	Activity	Description	Relevance of Regulation to Project
		(i)outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts;	which will connect to the new TSE substation (to be located on the same Farm Damfontein 8/114, a separate application has been submitted for the substation).
GN 544, 18 JUNE 2010	22	The construction of a road, outside urban areas; (i)with a reserve wider than 13.5 meters (ii) where no reserve exists where the road is wider than 8 metres, or 22; <del>(iii) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Notice 545 of 2010.</del>	The facility will require the upgrade of the existing road and construction of new access roads within the site.
GN 544, 18 JUNE 2010	23	The transformation of undeveloped, vacant or derelict land to- (ii)residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares.	The solar energy facility will involve transforming agricultural land-use to industrial land-use of an area outside an urban area and where the total area to be transformed is larger than 1 hectare but less than 20 hectares.
GN 546, 18 JUNE 2010	14 (a) (i)	The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation i. All areas outside urban areas.	The site is approx. 20ha and constitutes natural vegetation which will be cleared.

An environmental impact assessment is an effective planning and decision-making tool for the project developer as it provides the opportunity for the developer to be forewarned of potential environmental issues and to assess if potential environmental impacts can be avoided, minimised or mitigated to acceptable levels. The Basic Assessment process forms part of the feasibility studies for a proposed project and will inform the final design process. Comprehensive, independent environmental studies are required in accordance with the EIA Regulations to provide the competent authority with sufficient information in order to make an informed decision.

### **1.3 DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER AND EXPERTISE TO CONDUCT THE BASIC ASSESSMENT PROCESS**

Savannah Environmental was contracted by Wonderheuwel Solar Energy (Pty) Ltd 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 Wonderheuwel Solar Energy (Pty) Ltd. 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 Savannah Environmental team has considerable experience in environmental impact assessments and environmental management, and have been actively involved in undertaking environmental studies, for a wide variety of projects throughout South Africa, including those associated with electricity generation.

The EAP's from Savannah Environmental who are responsible for this project are:

- » *Karen Jodas* is a registered Professional Natural Scientist and holds a Master of Science degree. She has 14 years of experience consulting in the environmental field. Her key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. She is currently responsible for the project management of EIAs for several renewable energy projects across the country.
- » *Ravisha Ajodhapersadh*, the co-author of this report, holds an Honours Bachelor of Science degree in Environmental Management and has 4 years' experience in environmental management. She has undertaken EIAs for other proposed solar energy facilities in South Africa and has been involved in other projects in this area.



- » *Sheila Muniongo* - the principle author of this report, holds an Honours Bachelor of Science degree in Environmental Management and 1 and half years experience in the environmental field. Her key focus is on environmental impact assessments, public participation, environmental management plans and programmes, as well as mapping for a variety of environmental projects. She is currently the responsible EAP for several renewable energy projects EIAs across the country.
- » *Gabrielle Wood* – the public participation consultant for this project, hold an Honours Bachelor degree in Anthropology and has 5 years’ experience in Public Participation and Social consultancy including professional execution of public participation consulting for a variety of projects as well as managing and coordinating public participation processes for Environmental Impact Assessments (EIA).

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 numerous solar energy facilities.

Curricula vitae for the Savannah Environmental project team are included in **Appendix H**.

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

- » Ecology: Marianne Strohbach (of Savannah Environmental)
- » Soil & Agricultural Potential: Louis Di Pisani (of Eduplan cc)
- » Heritage resources: Celeste Booth (of the Albany Museum)
- » Visual: Johan Claassen (of Zone Land Solutions)
- » Palaeontology: Francois Durand (of Skarab cc)
- » Avifaunal specialist study: Jon Smallie (of WildSkies Ecological Services)

Specialist’s declaration of interests is included in the **Appendix I**.

## SECTION A: ACTIVITY INFORMATION

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

YES ✓

If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in **Appendix I**.

### 1. PROJECT DESCRIPTION

**Describe the project associated with the listed activities applied for**

Wonderheuwel Solar Energy (Pty) Ltd is proposing the establishment photovoltaic (PV) solar energy facility with a generation capacity of up to 20MW to be established on Portion 7 of Damfontein 114. The site is located approximately 15 km north-west of Noupoot in the Northern Cape Province of South Africa.

Infrastructure associated with the proposed PV facility will include:

- » Arrays of photovoltaic (PV) panels with a capacity of up to 20 MW;
- » Mounting structure to be either rammed steel piles or piles with pre-manufactured concrete footing to support the PV panels
- » Cabling between the project components, to be lain underground where practical;
- » Inverter/Transformer enclosures;
- » On site switching station and a new 66kV/132kV overhead power line of ~ 1700 m in length. Electricity generated will then be evacuated from the on-site substation to the new TSE Substation which is proposed to be located north west of the site, a distance of 1700m from the facility on an adjacent farm: Portion 8 of Farm Damfontein 114;
- » Internal access roads ~ 2km; fencing and workshop area for maintenance, storage and offices.

The proposed TSE 132/66 kV step-down substation is proposed on Portion 8 of the farm Damfontein 118 in order to connect the Wonderheuwel Solar Energy Facility to the Eskom grid. In addition, the TSE Substation is proposed to allow each of the solar energy facilities proposed in the larger area to connect to the Eskom grid. *A separate basic assessment report is being compiled for the planned substation (referred to as the TSE substation under DEA Ref No: 14/12/16/3/3/1/732).*

The components of the PV Facility are discussed in more detail below:

- » **Photovoltaic panels:** A photovoltaic (PV) cell is made of silicone which acts as a semiconductor used to produce the photovoltaic effect. Individual PV cells are linked and placed behind a protective glass sheet to form a photovoltaic panel.
- » **The Support Structure:** The PV panels will be fixed to a support structure set at an angle so to receive the maximum amount of solar radiation. The angle of the panel is dependent on the latitude of the proposed facility and the angles may be adjusted to optimise for summer or winter solar radiation characteristics.

- » **Cables** between the PV panels: Underground cables from the arrays of panels will feed into the invertors.
- » **Inverters:** The photovoltaic effect produces electricity in direct current. Therefore an inverter must be used to change it to alternating current. Approximately 16 inverters will be required for a 20MW facility.
- » **On site switching station** and a **new 66kV/132kV overhead power** line of ~ 1700 m. Electricity generated will then be evacuated from this substation to the new TSE Substation located north west, a distance of 950m from the facility;
- » Internal access **roads** (between 3 – 4m wide). Existing access road on the farm portion will be used and upgraded where necessary.
- » **Office / Workshop:** The workshop area will be used for storage and employees during the operational life of the facility.

A summary of the technical specification of the PV Facility is shown below.

PV Technology	poly-crystalline
Installed capacity	20 MW
Panel Dimensions	1.67 x 1m (230Wp)
Number of Panels	69120
Number of inverters	16
Main Transformer capacity	9 x 1.6 MVA
Final Height of installed panels from ground level	3-4 m
Height of inverters	2.5 m
Height of Transformers	2.5 m
Height of Buildings	3 m
Height of Fencing	2 m
Total area used for the plant	~19.54 Hectares

The PV panels are designed to operate continuously for more than 20 years, unattended and with low maintenance. An image of a PV facility is shown in **Figure 3**.



**Figure 3:** Illustration of a photovoltaic solar facility.

### **1.2 Construction of a PV Facility:**

In order to construct the proposed PV solar energy facility and associated infrastructure, a series of activities will need to be undertaken. The construction process is discussed in more detail below.

#### ***a) Conduct Surveys***

Prior to initiating construction, a number of surveys will be required including, but not limited to, a geotechnical survey, a site survey and, survey of substation site , power line and road servitudes.

#### ***b) Establishment of Access Roads to the Site***

Access to the site (directly from the R389 via existing entrance and gravel farm access road) will be required. Existing roads on the farm portion will be used and upgraded where necessary (little to no clearing will be required. Within the site itself, access will be required to the individual facility components for construction purposes (and later limited access for maintenance). Upgrade of access roads within the site will be required and new access roads will be required. Access track construction would normally comprise of compacted rock-fill with a layer of higher quality surfacing stone on top. The strength and durability properties of the rock strata at the proposed site are not known at this stage; this will need to be assessed via a geotechnical study to be conducted by the project proponent. Depending on the results of these studies, it may be possible, in some areas, to strip off the existing vegetation and ground surface and level the exposed formation to form an access track surface. The final layout of

the access roads will be determined following the identification of site related sensitivities.

**c) Undertake Site Preparation**

Site preparation activities will include clearance of vegetation at the footprint of each support structure, if required. Vegetation will be kept undisturbed as far as possible in and between the support structures. These activities will require the stripping of topsoil which will need to be stockpiled, backfilled and/or spread on site.

**d) Transport of Components and Equipment to Site**

The components and equipment required for the construction of the proposed facility will be brought to site in sections by means of national and provincial roads and then proposed internal access road. Some of the components (i.e. transformer) may be defined as abnormal loads in terms of the Road Traffic Act (Act No. 29 of 1989)<sup>1</sup> by virtue of the dimensional limitations (i.e. weight).

Typical civil engineering construction equipment will need to be brought to the site (e.g. excavators, trucks, graders, compaction equipment, cement trucks, etc.) as well as components required for the upgrade of the substation and site preparation.

**e) Establishment of Laydown Areas on Site**

Laydown and storage areas will be required for the typical construction equipment which will be required on site, and within the development footprint.

**f) Erect PV Cells and Construct Substation & Inverters**

The PV cells will be arranged in arrays. The frames will be fixed onto the ground with the use of concrete / rammed into the ground, depending on the soil conditions, depending on the soil conditions at the site. This will make the installation of the plant less invasive for the territory and facilitate the decommissioning at the end of its production cycle. The height of the PV panel structure will be up to 4 m.

Inverters will be installed to facilitate the connection between the solar energy facility and the Eskom electricity grid via the proposed TSE Substation. The position of the inverters within the footprint of the broader site will be informed by the final positioning of the PV components.

**g) Establishment of Ancillary Infrastructure (Power line, on site substation and office)**

Ancillary infrastructure includes an overhead power line feeding into the Eskom electricity network via the proposed TSE Substation, workshop, storage areas as well as a temporary contractor's equipment camp.

<sup>1</sup> A permit will be required for the transportation of these abnormal loads on public roads.

A 66kV/132kV overhead power line will be erected to connect the facility to the proposed TSE Substation which is located north west of the facility on the same farm portion. The power line will be 1700 m in length. The power line will follow a route 1 km north west from the north-western corner of the facility to connect to the 132 kV – 66 kV TSE substation. Note that the final grid connection will ultimately depend on Eskom.

The establishment of the above ancillary infrastructure will require the clearing of vegetation and levelling of the development site and the excavation of foundations prior to construction. A laydown area for building materials and equipment associated with these buildings will also be required.

#### ***h) Undertake Site Rehabilitation***

Once construction is completed and once 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 rehabilitated.

### **1.3 Operation Phase**

The electricity that is generated from the PV panels will be stepped up through the on-site inverters and feed into an on-site substation. Thereafter the power will be evacuated into a new power line to the proposed TSE substation which is proposed on an adjacent Farm Portion (Damfontein 8/114) to feed into the Eskom electricity grid.

It is anticipated that a full-time security, maintenance and control room staff will be required on site. Each component within the solar energy facility will be operational except under circumstances of mechanical breakdown, unfavourable weather conditions or maintenance activities. Maintenance activities for the PV plant will include cleaning of the PV Panel's (using water), trimming of vegetation (underneath the panels) and maintenance of the infrastructure. Water will be required for construction and cleaning the PV panels, as and when needed to remove dust that may collect on the panels. Approximately 21 -43.25 m<sup>3</sup>/wash cycle, 1-2 times per annum will be required during operations for cleaning the PV panels. Wonderheuvel Solar Energy is looking into purchasing water from Umsombuvo Local Municipality to supply water for the cleaning of the panels over the life of the solar park or the use of on-site bore holes (if sufficient water available).

### **1.4 Decommissioning Phase**

The solar energy facility is expected to have a lifespan of more than 20 years (with maintenance) and the power plant infrastructure would only be decommissioned once it has reached the end of its economic life. If economically feasible/desirable the decommissioning activities would comprise the disassembly and replacement of the

individual components with more appropriate technology/ infrastructure available at that time. However, if not deemed so, then the facility would be completely decommissioned which would include the following decommissioning activities.

**a) Site Preparation**

Site preparation activities will include confirming the integrity of the access to the site to accommodate the required equipment (e.g. lay down areas) and the mobilisation of decommissioning equipment.

**b) Disassemble Components**

The components would be disassembled, and reused and recycled (where possible), or disposed of in accordance with regulatory requirements.

**c) Rehabilitation**

Disturbed area (where infrastructure has been removed) will be rehabilitated, if required, depending on the future eland-use of the facility.

**Provide a detailed description of the listed activities associated with the project as applied for**

Listed activity as described in GN R.544, and 546544,	Description of project activity
544, 18 June 2010 1(i)  The construction of facilities or infrastructure for the generation of electricity where: i. the electricity output is more than 10 megawatts but less than 20 megawatts;	Construction of a Photovoltaic Solar Energy Facility with a maximum generating capacity of up to 20MW in an area covering approximately 20 ha. Inverters, Step-Up transformers, reticulation cables, medium voltage connection and protection equipment and mounting structures are ancillary infrastructure for this facility.
544, 18 June 2010 10(i)  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 but less than 275 kilovolts; ii.	The construction of a 66kV/132kV overhead power line from the solar facility to the Eskom electricity grid.
GN 544, 18 June 2010 22 The construction of a road, outside urban areas; (i) with a reserve wider than 13.5 meters (ii) where no reserve exists where the road is wider than 8 metres, or	The facility will require the upgrade of the existing road and construction of new access roads within the site.

<p>22-  <del>(iii) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Notice 545 of 2010.</del></p>	
<p>544, 18 June 2010 23</p> <p>The transformation of undeveloped, vacant or derelict land to:</p> <p>i. Residential, retails, commercial, recreational, industrial, or institutional use, outside an urban area, and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares.</p> <p>ii.</p>	<p>The solar energy facility will involve transforming agricultural land-use to industrial land-use of an area outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares.</p>
<p>GN546, 18 June 2010 14 (a) (i)</p> <p>The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation</p> <p>i. All areas outside urban areas.</p>	<p>The site constitutes natural vegetation that will be cleared during construction of the PV panels and associated infrastructure.</p>

## 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 as required by Regulation 22(2)(h) of GN R.543. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) 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 is 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.

The identification of alternatives should be in line with the Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004. Should the alternatives include different locations and lay-outs, the co-ordinates of the different alternatives must be provided. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

**a) Site alternatives**

<b>Alternative 1 (preferred alternative)</b>		
<p>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:</p> <ul style="list-style-type: none"> <li>» The solar resource (i.e. the Daily Direct Normal Irradiance for the town of Noupoot is 7.21 kw/h);</li> <li>» Site access (i.e. the site is easily accessible from the R389 to Noupoot, and then via a secondary gravel road);</li> <li>» Site slope and topography; (i.e. the site proposed for the placement of the PV panels is flat with no hills/mountains in the immediate vicinity that would cause shading issues or the need for excessive earthworks); and</li> <li>» Access to the national electricity grid for power evacuation (i.e. 66kV/132kV power line will convey the power from the PV units, through the transformers, to the switchgear and directly to the proposed TSE Substation) across a distance of approximately 950m.</li> </ul> <p>As such, no site alternatives have been proposed for the establishment of the proposed solar energy facility.</p>	<p>Lat (DDMMSS) 31°9' 4.1"S</p>	<p>Long (DDMMSS) 24°48' 44.5" E</p>

<b>Alternative 2</b>		
	Lat (DDMMSS)	Long (DDMMSS)
<b>Alternative 3</b>		
Description	Lat (DDMMSS)	Long (DDMMSS)

In the case of linear activities:

The co-ordinates for the 66kV/ 132kV power line are provided below:

**Wonderheuwel Power line:      Latitude (S):                      Longitude (E):**

• Starting point of the activity	31°	8'	12.44"	24°	49'	31.43"
• Middle/Additional point of the activity	31°	8'	4"	24°	50'	1.12"
• End point of the activity	31°	7'	54.40"	24°	50'	33.5"

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 250 meters along the route for each alternative alignment. **See Appendix J1.**

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the lay-out map provided in Appendix A.

**b) Lay-out alternatives**

No feasible and reasonable alternatives were identified for assessment.

<b>Alternative 1 (preferred alternative)</b>		
Description: <b>Layout Alternatives</b> Design and Layout alternatives were not assessed during the compilation of the basic assessment report. However, due to findings of the draft basic assessment report the initial layout was revised based on environmental sensitivities as indicated by the ecologist. The revised layout (see appendix <b>Figure 2</b> ) is therefore the recommended site layout alternative. The revised layout does not require further assessment as the changes are still within the initial footprint assessed during the Basic Assessment process and the potential impacts of the facility based on both layouts is the same.	Lat (DDMMSS) 31° 8' 8.71"S	Long (DDMMSS) 24° 49'23.37"E
<b>Alternative 2</b>		
Description	Lat (DDMMSS)	Long (DDMMSS)
<b>Alternative 3</b>		
Description	Lat (DDMMSS)	Long (DDMMSS)

**c) Technology alternatives**

<b>Alternative 1 (preferred alternative)</b>
Description: Few technological options exist in as far as PV technologies are concerned; those that are available are usually differentiated by weather and temperature conditions that prevail – so that optimality is obtained by the final choice. The impacts of any of the PV technology choices are the same. Therefore, the choice of technology does not affect the environmental impact of the proposed development. The construction, operation and decommissioning of the facility will also be the same irrespective of the technology chosen. Therefore, no alternatives were assessed in this regard.  No activity alternatives were assessed because the site has been identified by Wonderheuwel Solar Energy is highly desirable for the establishment of a photovoltaic plant and not any other development or renewable technologies such as wind or concentrated solar power (CSP).

Wind energy installations were not considered as a feasible and reasonable alternative as the proposed developmental area does not have the required wind resource.

CSP installations were not considered as a feasible and reasonable alternative as they require a large amount of water for cooling, unlike PV where water is only required for cleaning purposes (considering the fact that the site is in an arid area.). PV is also relatively easier to construct as opposed to CSP.

Therefore, a PV facility is considered by Wonderheuwel Solar Energy to be the only feasible activity for the proposed site.

<b>Alternative 2</b>
<b>Alternative 3</b>

**d) Other alternatives (e.g. scheduling, demand, input, scale and design alternatives)**

<b>Alternative 1 (preferred alternative)</b>
Description: <b>Operating Alternatives</b> 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.
Alternative 2
Alternative 3

**e) No-go alternative**

This option is assessed as the "no go alternative" in this Basic Assessment Report.

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

### 3. PHYSICAL SIZE OF THE ACTIVITY

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

**Alternative:**

Alternative A1<sup>2</sup> (preferred activity alternative)  
 Alternative A2 (if any)  
 Alternative A3 (if any)

**Size of the activity:**

~190 000 m <sup>2</sup>
m <sup>2</sup>
m <sup>2</sup>

or, for linear activities:

**Alternative:**

Alternative A1 (preferred activity alternative)  
 Alternative A2 (if any)  
 Alternative A3 (if any)

**Length of the activity:**

1700m
m
m

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

**Alternative:**

Alternative A1 (preferred activity alternative)  
 Alternative A2 (if any)  
 Alternative A3 (if any)

**Size of the site/servitude:**

14256328 m <sup>2</sup> 30m servitude (power line)
m <sup>2</sup>
m <sup>2</sup>

### 4. SITE ACCESS

Does ready access to the site exist?

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

<b>YES</b> ✓	
m	

<sup>2</sup> "Alternative A.." refer to activity, process, technology or other alternatives.

Describe the type of access road planned:

Access to the site is accessible directly from the R389 via existing entrance and gravel farm access road. The existing entrance to the Farm will be used, then a new access road to the panels will be created

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. See **Appendix A**

A site plan showing the position of the access road, as well as an indication of the road in relation to the site is included in **Appendix A**.

## 5. 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 accurate indication of the project site position as well as the positions of the alternative sites, if any;
- indication of all the alternatives identified;
- closest town(s);
- 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).

An A3 Locality Map is attached as Appendix A.

## 6. LAYOUT/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:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land use zoning of the site;
- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

A detailed site plan(s) for the activity is attached as <b>Appendix A</b> .
---

## 7. SENSITIVITY MAP

The layout/route plan as indicated above must be overlain with a sensitivity map that indicates all the sensitive areas associated with the site, including, but not limited to:

- watercourses;
- 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 infested with alien species); and
- critical biodiversity areas.

The sensitivity map must also cover areas within 100m of the site and must be attached in **Appendix A**.

A sensitivity map covering areas within 100m of the site is attached in <b>Appendix A</b> .
---

## 8. 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 report. 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. Annotated photographs are included in **Appendix B**.

## 9. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of at least 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**.




## 10. ACTIVITY MOTIVATION

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

<b>1. Is the activity permitted in terms of the property's existing land use rights?</b>	<b>NO</b> ✓	Please explain
The site is zoned agricultural. An application will be required to be made to change / rezone the land use rights to accommodate the solar energy facility		
<b>2. Will the activity be in line with the following?</b>		
<b>(a) Provincial Spatial Development Framework (PSDF)</b>	<b>YES</b> ✓	Please explain
The Northern Cape Province Spatial Development Framework (NCPSDF) makes reference to the need to ensure the availability of inexpensive energy. The section notes that in order to promote economic growth in the Northern Cape the availability of electricity to key industrial users at critical localities at rates that enhance the competitiveness of their industries must be ensured. At the same time, the development of new sources of energy through the promotion of the adoption of energy applications that display a synergy with the province's natural resource endowments must be encouraged. In this regard the NCPSDF notes "the development of energy sources such as solar energy, the natural gas fields, bio-fuels, etc., could be some of the means by which new economic opportunity and activity is generated in the Northern Cape". The NCPSDF also highlights the importance of close co-operation between the public and private sectors in order for the economic development potential of the Northern Cape to be realised.		
<b>(b) Urban edge / Edge of Built environment for the area</b>	<b>NO</b> ✓	Please explain
The site is ~15 north-west of the urban edge related to the town of Noupoot. The site is proposed outside an urban area. The Farm Damfontein 7/114 is currently utilised for farming (grazing of livestock). Addition of a PV Facility on the Farm Damfontein 7/114		



<p>will not significantly alter the urban edge of Noupoot or the Umsombuvu Local Municipality, as the current farming activities will continue on areas of the Farm which will not be occupied by infrastructure for the solar energy facility. Therefore the project compatible with the farming activities in a rural area which is outside the urban edge of the Umsombuvu Local Municipality.</p>		
<p><b>(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).</b></p>	<p>YES✓</p>	<p>Please explain</p>
<p>The Umsobomvu Local Municipality (LM) Integrated Development Plan (2012/2013) has identified Basic Service Delivery as a Key Performance Area; this will be achieved through facilitating access to electricity for each consumer within Municipality. Consequently, this project is in line with the LM IDP by assisting the LM achieves its goal of increasing electricity capacity in the area.</p>		
<p><b>(d) Approved Structure Plan of the Municipality</b></p>	<p>YES✓</p>	<p>Please explain</p>
<p>According to the Umsombuvu Local Municipality strategy plan, a key development objective is to provide access to electricity to all households in the District by 2014. To achieve this, the District Municipality aims to i) Fast track the delivery of free basic electricity and ii) co-ordinate the maintenance and upgrading of the existing electricity infrastructure. While no specific mention is made of the promotion of alternative energy sources, the proposed project would potentially support a number of the development goals and objectives of the Pixley Ka Seme District Municipality (PKSDM). The project will be in line with the Municipality's structure plan.</p>		
<p><b>(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)</b></p>	<p>YES✓</p>	<p>Please explain</p>
<p>The Umsombuvu Local Municipality does not have an EMF, however an Integrated Environmental Management Programme was compiled by the District Municipality to ensure that land use decision making must be taken with adequate environmental resource information is available in other to ensure sustainable and appropriate environmental management to the benefit of its residents. One of the set goals for the Plan is ensuring that all environmental issues are appropriately addressed.</p> <p>Renewable energy projects such the proposed Wonderheuvel Solar Energy project will contribute to clean energy generation as a sustainable resource and holds huge benefits for the local region and the country as a whole. Renewable resources generally</p>		

<p>operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future, the project aims on achieving the set goals for the Plan through addressing all possible environmental issues associated with the development and address measure to mitigate environmental issues.</p>			
<p><b>(f) Any other Plans (e.g. Guide Plan)</b></p>	<p><b>YES</b></p>	<p><b>NO</b></p>	<p>Please explain</p>
<p>N/A</p>			
<p><b>3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?</b></p>	<p><b>YES</b>✓</p>		<p>Please explain</p>
<p>This project is not specifically considered within the existing approved Pixley ka Seme SDF. However the Umsobomvu Local Municipality Integrated Development Plan (2012/2013) identifies infrastructure i.e. electricity as a key priorities for the LM; the proposed development will be in line with the key priorities of the ULM IDP.</p>			
<p><b>4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)</b></p>	<p><b>YES</b>✓</p>		<p>Please explain</p>
<p>The evacuation of additional power into the Eskom grid will serve to improve the stability of the grid for the immediate area, assist the government in achieving the goal of 17GW renewable energy as part of the electricity generation technology mix by 2030, and assist in the reduction in the need to mine non-renewable resources such as coal for conventional power generation.</p> <p>The proposed activity is not a necessarily a societal priority for the community; however the development will benefit the local community through jobs creation, skills development opportunities and training which will in turn reduce poverty level that the area is currently facing; strengthen electricity supply for the area.</p>			
<p><b>5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)</b></p>		<p><b>NO</b>✓</p>	<p>Please explain</p>
<p>No, services are not adequate i.e. the two nearest substations will not be able to</p>			

accommodate this project together with the other four solar projects proposed in the same vicinity. The applicant plans on construction 132 kV – 66 kV step-down substation in order to connect the Wonderheuwel Solar Energy Facility to the Eskom grid. In addition, the proposed TSE Substation will allow each of the solar energy facilities proposed in the larger area to connect to the Eskom grid. The developer will build the substation and thereafter hand it over to Eskom (who will then own, operate and maintain the substation).

Other services such as water will be sourced from the Umsombuvu Local Municipality.

<p><b>6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)</b></p>	<p><b>NO</b>✓</p>	<p>Please explain</p>
---	-------------------	-----------------------

The proposed project is to be developed by a private developer (i.e. Wonderheuwel Solar Energy) and not the municipality. It therefore does not fall within the infrastructure planning of the municipality. The project will not have any implications for the municipality but assist them in their infrastructural planning priorities through the increasing electricity capacity.

<p><b>7. Is this project part of a national programme to address an issue of national concern or importance?</b></p>	<p><b>YES</b>✓</p>	<p>Please explain</p>
--	--------------------	-----------------------

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 PV or CPV technology). The proposed project is to contribute towards this goal through generation of renewable energy.

<p><b>8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)</b></p>	<p><b>YES</b>✓</p>	<p>Please explain</p>
---	--------------------	-----------------------

*Site access*

The site can be accessed easily via existing access roads from R389 road.

*Climatic Conditions*

The economic viability of a photovoltaic plant is directly dependent on the annual direct solar irradiation values. A study of available radiation data shows that the proposed site is uniformly irradiated by the sun. In addition, compared to other areas in the country with similar irradiation, the site experiences moderate temperatures which are suitable for PV technology.

*Gradient*


A level surface area (i.e. with a minimal gradient in the region of 1%) is preferred for the installation of PV panels and specifically for PV technologies (Fluri, 2009). This reduces the need for extensive earthworks associated with the levelling of a site, thereby minimising environmental impacts. The proposed area for the proposed PV plant is generally on a flat location with slopes less than 5 degrees.

*Grid Connection*

The proposed facility is in a close proximity (approx. 950 m) to the proposed TSE substation, the new substation will have enough capacity to accommodate the proposed PV Solar plant facility.

<b>9. Is the development the best practicable environmental option for this land/site?</b>	<b>YES</b> ✓		Please explain
--	--------------	--	----------------

The site (approx. 1425 ha) itself as well as most of the surrounding areas is primarily used for small livestock and game farming. The proposed activity which will occupy an area less than 20 ha will represent a change in land use and land form to what is currently the status quo. However the proposed development is for proposed PV solar energy; this is a renewable energy project, which is the best practicable environmental option for the type of land since the proposed development can allow the current land-use to continue on the rest of the farm portion (i.e. the rest of the land which is not utilised for the facility).

<b>10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?</b>	<b>YES</b> ✓		Please explain
--	--------------	---	----------------

- » No environmental fatal flaws have been identified to be associated with the project at this stage in the project. The negative impacts for the project include:
  - Clearing of natural vegetation for the proposed footprint area, increasing the potential for soil erosion, deterioration of the biotic, abiotic and economic properties of soil, and the long-term loss of natural vegetation;
  - Possible destruction of stone artefact occurrences and scatters. That are scattered over the extent of the proposed Wonderheuvel Solar Energy Facility area and within the existing site access that is proposed to be used as the access road for the project.
- » Most of these impacts can be managed and mitigated as outlined in the Impact Assessment and Environmental Management Programme. Below are some of the

benefits associated with the development:

- 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.

The negative impacts referred to above could also result from activities associated with the current land use. This is not true of the positive impacts. It is considered reasonable that the benefits of the proposed land use/development will outweigh the negative impacts.

<b>11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?</b>		<b>NO</b> ✓	Please explain
There are similar developments being proposed in the Umsombuvu Local Municipality which have received environmental authorisations; however no solar projects have been developed yet in the area. It is considered that the precedent for the development of renewable energy projects in this area and within this Municipality has already been set, and local support has been shown by landowners, and the Municipality.			
<b>12. Will any person's rights be negatively affected by the proposed activity/ies?</b>		<b>NO</b> ✓	Please explain
The proposed project will be taking place in a private-owned land; and it will have non-significant harm to both humans and the environment.			
<b>13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?</b>		<b>NO</b> ✓	Please explain
The site is ~15 north-west of the urban edge related to the town of Noupport. The site is proposed outside an urban area. The Farm Damfontein 7/114 is currently utilised for farming (grazing of livestock). Addition of a PV Facility on the Farm Damfontein 7/114			

<p>will not significantly alter the urban edge of Noupoort or the Umsombuvu Local Municipality, as the current farming activities will continue on areas of the Farm which will not be occupied by infrastructure for the solar energy facility. Therefore the project compatible with the farming activities in a rural area which is outside the urban edge of the Umsombuvu Local Municipality.</p>		
<p><b>14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?</b></p>	<p>YES ✓</p>	<p>Please explain</p>
<p>SIP 8 looks at green energy in support of South African economy; SIP 9 describes Electricity Generation to support socio-economic development; and SIP 10 looks at the expansion of electricity Transmission and Distribution to support economic development. Therefore the proposed activity will contribute to the SIPS.</p>		
<p><b>15. What will the benefits be to society in general and to the local communities?</b></p>		<p>Please explain</p>
<p>Job opportunities, albeit limited, will be created during the construction and operation of the proposed facility. In addition, local and regional economic benefits would be realised through the additional revenue generated as a result of the proposed project (through direct and indirect job opportunities, local spend, local procurement, etc.).</p>		
<p><b>16. Any other need and desirability considerations related to the proposed activity?</b></p>		<p>Please explain</p>
<p>N/A</p>		
<p><b>17. How does the project fit into the National Development Plan for 2030?</b></p>		<p>Please explain</p>
<p>One of the National Development Plan for 2030 is the transition to low carbon energy through speeding up and expanding renewable energy. This project will fit into this vision since it aims on increasing electricity supply through carbon-free methods.</p>		
<p><b>18. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.</b></p>		
<p>The general objectives of Integrated Environmental Management have been taken into account for this Basic Assessment report by means of identifying, predicting and evaluating the actual and potential impacts on the environment, socio-economic conditions and cultural heritage component. The risks, consequences, alternatives as well as options for mitigation of activities have also been considered with a view to minimise negative impacts, maximise benefits, and promote compliance with the principles of environmental management.</p>		
<p><b>19. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.</b></p>		
<p>The principle of environmental management as set out in section of NEMA states that:                  » Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably;</p>		

- » Development must be sustainable socially (people), environmentally (planet) and economically (prosperity);and
- » Sustainable development requires the consideration of all the relevant factors,

These principles have been taken into account for this Basic Assessment report by means of identifying, predicting and evaluating the actual and potential impacts on the environment, socio-economic conditions and cultural heritage component. The risks, consequences, alternatives as well as options for mitigation of activities have also been considered with a view to minimise negative impacts, maximise benefits, and promote compliance with the principles of environmental management.

### **11. 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:

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
<b>National Legislation</b>			
<p>National Environmental Management Act (Act No 107 of 1998)</p>	<p>The Basic Assessment Regulations have been promulgated in terms of Chapter 5 of the Act. Listed activities which may not commence without an environmental authorisation are identified within these Regulations.</p> <p>In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation.</p> <p>In terms of GN R543, R544 and R546 of 18 June 2010, a Basic Assessment Process is required to be undertaken for the proposed project.</p>	<p>Department of Environmental Affairs – competent authority</p> <p>Department of Environmental and Nature Conservation (DENC)- commenting authority</p>	<p>The listed activities triggered by the proposed solar energy facility have been identified and assessed in the Basic Assessment Process being undertaken. This Basic Assessment Report will be submitted to the competent and commenting authority in support of the application for authorisation.</p>
<p>National Environmental Management Act (Act No 107 of 1998)</p>	<p>In terms of the Duty of Care Provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with this project is avoided, stopped or minimised.</p> <p>In terms of NEMA, it has become the legal duty of a project proponent to consider a project holistically, and to consider the cumulative effect of a variety of impacts.</p>	<p>Department of Environmental Affairs</p>	<p>While no permitting or licensing requirements arise directly by virtue of the proposed project, this section has found application during the Basic Assessment Process through the consideration of potential impacts (cumulative, direct, and indirect). It will continue to apply throughout the life</p>



Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
			cycle of the project.
Environment Conservation Act (Act No 73 of 1989)	National Noise Control Regulations (GN R154 dated 10 January 1992)	Department of Environmental Affairs  Department of Environmental and Nature Conservation (DENC)-  Local Authorities	Noise impacts are expected to be associated with the construction phase of the project and are not likely to present a significant intrusion to the local community. Therefore is no requirement for a noise permit in terms of the legislation.  On-site activities should be limited to 6:00am - 6:00pm, Monday – Saturday (excluding public holidays).  Should activities need to be undertaken outside of these times, the surrounding communities will need to be notified and appropriate approval will be obtained from DEA and the Local Municipality.
National Water Act (Act No 36 of 1998)	Water uses under S21 of the Act must be licensed, unless such water use falls into one of the categories listed in S22 of the Act or falls under the general	Department of Water Affairs	A water use license (WUL) is required to be obtained if wetlands or drainage

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>authorisation (and then registration of the water use is required).</p> <p>Consumptive water uses may include the taking of water from a water resource - Sections 21a and b.</p> <p>Non-consumptive water uses may include impeding or diverting of flow in a water course - Section 21c; and altering of bed, banks or characteristics of a watercourse - Section 21i.</p>	<p>Provincial Department of Water Affairs</p>	<p>lines are impacted on, or if infrastructure lies within 500m of such features. Pans occur on the project site, but outside of the development footprint.</p> <p>Should water be abstracted from ground water/ a borehole on site for use within the facility, a water use license may be required.</p>
<p>Minerals and Petroleum Resources Development Act (Act No 28 of 2002)</p>	<p>A mining permit or mining right may be required where a mineral in question is to be mined (e.g. materials from a borrow pit) in accordance with the provisions of the Act.</p> <p>Requirements for Environmental Management Programmes and Environmental Management Plans are set out in S39 of the Act.</p> <p>S53 Department of Mineral Resources: Approval from the Department of Mineral Resources (DMR) may be required to use land surface contrary to the objects of the Act in terms of section 53 of the Mineral and Petroleum Resources Development Act, (Act No 28 of 2002): In terms of the Act approval from the Minister of Mineral Resources is required to ensure that proposed activities do not sterilise a mineral resources that might</p>	<p>Department of Mineral Resources</p>	<p>As no borrow pits are expected to be required for the construction of the facility, no mining permit or right is required to be obtained.</p> <p>A Section 53 application will be submitted the Northern Cape DMR office.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
National Environmental Management: Air Quality Act (Act No 39 of 2004)	<p>occur on site.</p> <p>Measures in respect of dust control (S32) – no regulations promulgated yet.</p> <p>Measures to control noise (S34) - no regulations promulgated yet.</p>	Department of Environmental Affairs	<p>No permitting or licensing requirements arise from this legislation.</p> <p>The Act provides that an air quality officer may require any person to submit an atmospheric impact report if there is reasonable suspicion that the person has failed to comply with the Act.</p>
National Heritage Resources Act (Act No 25 of 1999)	<ul style="list-style-type: none"> <li>» Stipulates assessment criteria and categories of heritage resources according to their significance (S7).</li> <li>» Provides for the protection of all archaeological and palaeontological sites, and meteorites (S35).</li> <li>» Provides for the conservation and care of cemeteries and graves by SAHRA where this is not the responsibility of any other authority (S36).</li> <li>» Lists activities which require developers any person who intends to undertake to notify the responsible heritage resources authority and furnish it with details regarding the location, nature, and extent of the proposed development (S38).</li> <li>» Requires the compilation of a Conservation Management Plan as well as a permit from SAHRA for the presentation of archaeological sites as part of</li> </ul>	South African Heritage Resources Agency	An HIA and PIA has been undertaken as part of the Basic Assessment Process to identify heritage sites.(See Appendix D2)

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
<p>National Environmental Management: Biodiversity Act (Act No 10 of 2004)</p>	<p>tourism attraction (S44).</p> <ul style="list-style-type: none"> <li>» Provides for the MEC/Minister to identify any process or activity in such a listed ecosystem as a threatening process (S53)</li> <li>» A list of threatened and protected species has been published in terms of S 56(1) - Government Gazette 29657.</li> <li>» Three government notices have been published, i.e. GN R 150 (Commencement of Threatened and Protected Species Regulations, 2007), GN R 151 (Lists of critically endangered, vulnerable and protected species) and GN R 152 (Threatened or Protected Species Regulations).</li> <li>» Provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (National Environmental Management: Biodiversity Act: National list of ecosystems that are threatened and in need of protection, (G 34809, GN 1002), 9 December 2011).</li> <li>» This Act also regulates alien and invader species.</li> <li>» Under this Act, a permit would be required for any</li> </ul>	<p>Department of Environmental Affairs</p>	<p>As the applicant will not carry out any restricted activity, as is defined in S1 of the Act, no permit is required to be obtained in this regard.</p> <p>Specialist flora and fauna studies have been undertaken as part of the Basic Assessment Process. As such the potentially occurrence of critically endangered, endangered, vulnerable, and protected species and the potential for them to be affected has been considered.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	activity which is of a nature that may negatively impact on the survival of a listed protected species.		
Conservation of Agricultural Resources Act (Act No 43 of 1983)	<ul style="list-style-type: none"> <li>» Prohibition of the spreading of weeds (S5)</li> <li>» Classification of categories of weeds &amp; invader plants (Regulation 15 of GN R1048) &amp; restrictions in terms of where these species may occur.</li> <li>» Requirement &amp; methods to implement control measures for alien and invasive plant species (Regulation 15E of GN R1048).</li> </ul>	Department of Agriculture	<p>This Act will find application throughout the life cycle of the project. In this regard, soil erosion prevention and soil conservation strategies must be developed and implemented. In addition, a weed control and management plan must be implemented.</p> <p>The permission of agricultural authorities will be required if the Project requires the draining of vleis, marshes or water sponges on land outside urban areas.</p>
National Forests Act (Act No. 84 of 1998)	According to this act, the Minister has declared a tree, group of trees, woodland or a species of trees as protected. The prohibitions provide that 'no person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister'.	National Department of Forestry	They are no protected trees in the study area.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
National Veld and Forest Fire Act (Act 101 of 1998)	<p>In terms of S12 the applicant must ensure that the firebreak is wide and long enough to have a reasonable chance of preventing the fire from spreading, not causing erosion, and is reasonably free of inflammable material.</p> <p>In terms of S17, the applicant must have such equipment, protective clothing, and trained personnel for extinguishing fires.</p>	Department of Agriculture, Forestry and Fisheries (DAFF)	While no permitting or licensing requirements arise from this legislation, this act will find application during the construction and operational phase of the project.
Hazardous Substances Act (Act No 15 of 1973)	<p>This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitising or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products.</p> <p>Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc, nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared as Group I or Group II substance</p> <p>Group IV: any electronic product; and</p> <p>Group V: any radioactive material.</p> <p>The use, conveyance, or storage of any hazardous</p>	Department of Health	It is necessary to identify and list all the Group I, II, III, and IV hazardous substances that may be on the site and in what operational context they are used, stored or handled. If applicable, a license is required to be obtained from the Department of Health.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	substance (such as distillate fuel) is prohibited without an appropriate license being in force.		
Development Facilitation Act (Act No 67 of 1995)	<p>Provides for the overall framework and administrative structures for planning throughout the Republic.</p> <p>S (2 - 4) provide general principles for land development and conflict resolution.</p>	Local Municipality	The applicant must submit a land development application in the prescribed manner and form as provided for in the Act. A land development applicant who wishes to establish a land development area must comply with procedures set out in the Act.
Subdivision of Agricultural Land Act (Act No 70 of 1970)	Details land subdivision requirements and procedures. Applies for subdivision of all agricultural land in the province	Department of Agriculture	Subdivision will have to be in place prior to any subdivision approval in terms of S24 and S17 of the Act.
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	<p>The Minister may by notice in the <i>Gazette</i> publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment.</p> <p>The Minister may amend the list by –</p> <ul style="list-style-type: none"> <li>» Adding other waste management activities to the list.</li> <li>» Removing waste management activities from the list.</li> <li>» Making other changes to the particulars on the list.</li> </ul>	<p>National Department of Water and Environmental Affairs</p> <p>Provincial Department of Environmental Affairs (general waste)</p>	<p>As no waste disposal site is to be associated with the proposed project, no permit is required in this regard.</p> <p>Waste handling, storage and disposal during construction and operation is required to be undertaken in accordance</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>In terms of the Regulations published in terms of this Act (GN 718), A Basic Assessment or Environmental Impact Assessment is required to be undertaken for identified listed activities.</p> <p>Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that:</p> <ul style="list-style-type: none"> <li>» The containers in which any waste is stored, are intact and not corroded or in</li> <li>» any other way rendered unfit for the safe storage of waste.</li> <li>» Adequate measures are taken to prevent accidental spillage or leaking.</li> <li>» The waste cannot be blown away.</li> <li>» Nuisances such as odour, visual impacts and breeding of vectors do not arise; and</li> <li>» Pollution of the environment and harm to health are prevented.</li> </ul>		<p>with the requirements of the Act, as detailed in the EMP (refer to Appendix G).</p> <p>The volumes of waste to be generated and stored on the site during construction and operation of the facility will not require a waste license (provided these remain below the prescribed thresholds).</p>
<p>National Road Traffic Act (Act No 93 of 1996)</p>	<ul style="list-style-type: none"> <li>» The technical recommendations for highways (TRH 11): "Final Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads" outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed.</li> <li>» Legal axle load limits and the restrictions imposed</li> </ul>	<ul style="list-style-type: none"> <li>» South African National Roads Agency Limited (national roads)</li> <li>» Provincial Department of Transport</li> </ul>	<p>An abnormal load/vehicle permit may be required to transport the various components to site for construction. These include route clearances and permits will be required for vehicles carrying abnormally heavy</p>



Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges, and culverts.</p> <p>» The general conditions, limitations, and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power/mass ratio, mass distribution, and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the National Road Traffic Act and the relevant Regulations.</p>		<p>or abnormally dimensioned loads.</p> <p>Transport vehicles exceeding the dimensional limitations (length) of 22m. Depending on the trailer configuration and height when loaded, some of the power station components may not meet specified dimensional limitations (height and width).</p>
<p>Promotion of Access to Information Act (Act No 2 of 2000)</p>	<p>All requests for access to information held by state or private body are provided for in the Act under S11.</p>	<p>Department of Environmental Affairs</p>	<p>No permitting or licensing requirements.</p>
<p>Promotion of Administrative Justice Act (Act No 3 of 2000)</p>	<p>In terms of S3 the government is required to act lawfully and take procedurally fair, reasonable, and rational decisions.</p> <p>Interested and affected parties have a right to be heard.</p>	<p>Department of Environmental Affairs</p>	<p>No permitting or licensing requirements.</p>
<p><b>Provincial Legislation</b></p>			
<p>Northern Cape Nature Conservation Act, Act No. 9 of 2009</p>	<p>This Act provides for the sustainable utilisation of wild animals, aquatic biota and plants; provides for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora; provides for offences and penalties for contravention of the Act; provides for the appointment of nature</p>	<p>Provincial Department of Environmental Affairs</p>	<p>Permitting or licensing requirements arise from this legislation for the proposed activities to be undertaken for the proposed project as there</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>conservators to implement the provisions of the Act; and provides for the issuing of permits and other authorisations. Amongst other regulations, the following may apply to the current project:</p> <ul style="list-style-type: none"> <li>» Boundary fences may not be altered in such a way as to prevent wild animals from freely moving onto or off of a property;</li> <li>» Aquatic habitats may not be destroyed or damaged;</li> <li>» The owner of land upon which an invasive species is found (plant or animal) must take the necessary steps to eradicate or destroy such species.</li> <li>» The Act provides lists of protected species for the Province.</li> </ul>		<p>are a succulent plants species on the proposed development site. A permit is required to remove the plants.</p>

## 12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

### 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?

± 4m<sup>3</sup>

± 4m<sup>3</sup> of solid construction waste consisting mainly of vegetation, spoil material from clearing activities and metal and cabling off cuts. Therefore minimal quantities of packaging materials for the various components, excess concrete spillage and excess building materials will be produced on site during the construction phase. The quantity would be readily handled by contractors on site.

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

It is anticipated that construction waste will be comprised mainly of spoil material from cleaning activities as well as metal and cabling offcuts. Non-recyclable waste will be trucked to the nearest registered waste disposal facility for appropriate disposal.

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

In order to comply with legal requirements should there be excess solid construction waste after recycling options have been exhausted, the waste will be trucked to the nearest registered waste disposal facility for appropriate disposal.

Will the activity produce solid waste during its operational phase?

**NO** ✓

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

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

If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.

Where will the solid waste be disposed of 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 NEM:WA?

	<b>NO</b> ✓
--	-------------

If YES, inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

Is the activity that is being applied for a solid waste handling or treatment facility?

	<b>NO</b> ✓
--	-------------

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. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

**b) Liquid effluent**

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

	<b>NO</b> ✓
--	-------------

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

	m <sup>3</sup>
--	----------------

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

	<b>NO</b> ✓
--	-------------

*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?

	<b>NO</b> ✓
--	-------------

If YES, provide the particulars of the facility:

<b>Facility name:</b>			
<b>Contact person:</b>			
<b>Postal address:</b>			
<b>Postal code:</b>			
<b>Telephone:</b>		<b>Cell:</b>	
<b>E-mail:</b>		<b>Fax:</b>	

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

--

**c) Emissions into the atmosphere**

Will the activity release emissions into the atmosphere other than exhaust emissions and dust associated with construction phase activities?

	<b>NO</b> ✓

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

If YES, the applicant must 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.

**d) Waste permit**

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA?

	<b>NO</b> ✓
--	-------------

If YES, please submit evidence that an application for a waste permit has been submitted to the competent authority

**e) Generation of noise**

Will the activity generate noise?

	<b>NO</b> ✓

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:

Minimal noise generated by the moving trucks, this is not regarded as significant noise source/ impact and will most likely not constitute a "disturbing noise".

**13. WATER USE**

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

<b>Municipal</b> ✓	Water board	Groundwater	River, stream, dam or lake	Other	The activity will not use water
--------------------	-------------	-------------	----------------------------	-------	---------------------------------

*Water will be used to clean the PV panels twice per annum every three months, or more frequently if deemed necessary. Water will be trucked in (i.e. likely to be sourced from the Umsobomvu Local Municipality) and high pressure hoses will be used to clean the panels. It is estimated that for every cleaning session 13 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 authorisation (general authorisation or water use license) from the Department of Water Affairs?

<b>NO</b> ✓

If YES, please provide proof that the application has been submitted to the Department of Water Affairs.

#### **14.ENERGY EFFICIENCY**

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

The activity will use very little of the energy it produces and is in itself an activity that is proposed to generate electricity from a cleaner alternative energy source (i.e. solar radiation).

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

The purpose of a PV installation is to utilise an alternative energy source (i.e. solar radiation) for the production of electricity. Therefore it is not required to consider any additional alternative energy sources.

**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 B and indicate the area, which is covered by each copy No. on the Site Plan.

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

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

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

<b>YES</b> ✓	
--------------	--

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in **Appendix D**.

<b>Property description/physical address:</b>	<b>Province</b>	Northern Cape Province
	<b>District Municipality</b>	Pixley ka Seme District Municipality
	<b>Local Municipality</b>	Umsobomvu Local Municipality
	<b>Ward Number(s)</b>	2
	<b>Farm name and number</b>	Damfontein 114
	<b>Portion number</b>	7
	<b>SG Code</b>	C03000000000114000007

Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application including the same information as indicated above.

<b>Current land-use zoning as per local municipality IDP/records:</b>	Agriculture, used for grazing of livestock
---	--

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** ✓

### 1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

#### Alternative S1:

<b>Flat</b> ✓	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:

2.1 Ridgeline	<input type="checkbox"/>	2.4 Closed valley	<input type="checkbox"/>	2.7 <b>Undulating plain / low hills</b>	<input checked="" type="checkbox"/>
2.2 Plateau	<input type="checkbox"/>	2.5 Open valley	<input type="checkbox"/>	2.8 Dune	<input type="checkbox"/>
2.3 Side slope of hill/mountain	<input type="checkbox"/>	<b>2.6 Plain</b>	<input checked="" type="checkbox"/>	2.9 Seafront	<input type="checkbox"/>

### 3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

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

	Alternative S1:	Alternative S2 (if any):	Alternative S3 (if any):
Shallow water table (less than 1.5m deep)	<input type="checkbox"/> <b>NO</b> ✓	YES NO	YES NO
Dolomite, sinkhole or doline areas	<input type="checkbox"/> <b>NO</b> ✓	YES NO	YES NO
Seasonally wet soils (often close to water bodies)	<input type="checkbox"/> <b>NO</b> ✓	YES NO	YES NO
Unstable rocky slopes or steep slopes with loose soil	<input type="checkbox"/> <b>NO</b> ✓	YES NO	YES NO



Dispersive soils (soils that dissolve in water)	<input type="checkbox"/>	<input checked="" type="checkbox"/> NO✓	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Soils with high clay content (clay fraction more than 40%)	<input checked="" type="checkbox"/> YES✓	<input type="checkbox"/>	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Any other unstable soil or geological feature	<input type="checkbox"/>	<input checked="" type="checkbox"/> NO✓	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> YES	<input type="checkbox"/> NO
An area sensitive to erosion	<input checked="" type="checkbox"/> YES✓	<input type="checkbox"/>	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> YES	<input type="checkbox"/> 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).

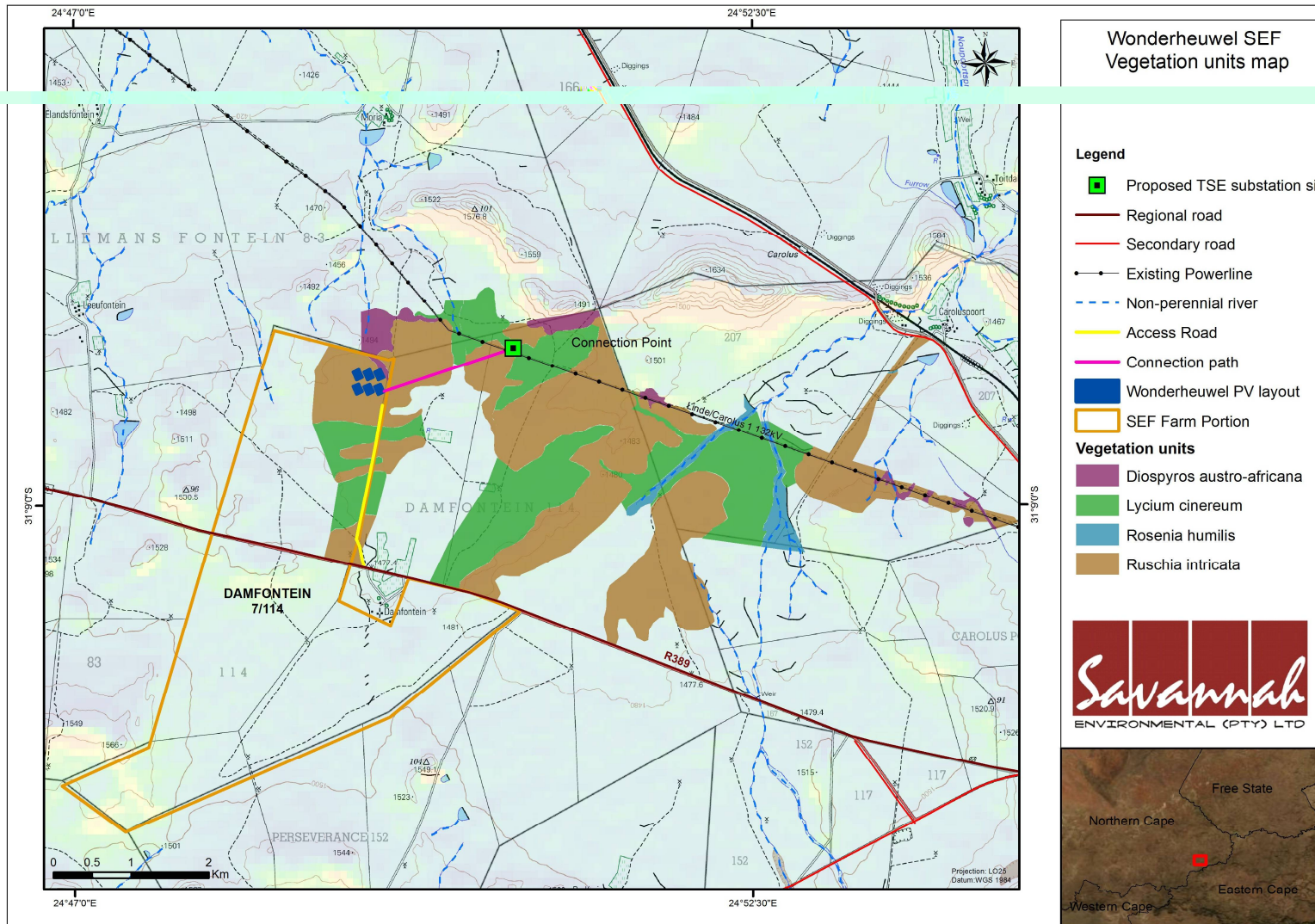
Natural veld - good condition <sup>E</sup>	<b>Natural veld with scattered aliens<sup>E</sup>✓</b>	Natural veld with heavy alien infestation <sup>E</sup>	Veld dominated by alien species <sup>E</sup>	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

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.

Three vegetation units could be identified (**Figure 4**):

- » Unit 1: The *Diospyros austro-africana* – *Stipagrostis obtusa* shrublands occur on small rocky outcrops and ridges with a variable slope (sensitivity high), and are part of the Besemkaree Koppies Shrublands.
- » Unit 2: The *Ruschia intricata* – *Tragus koelerioides* dwarf shrublands cover large tracts of the study area – primarily on gently undulating plains with shallow soils, and are referred to by local farmers as 'randjiesveld' (sensitivity medium-low), and overall part of the Eastern Upper Karoo vegetation.
- » Unit 3: The *Lycium cinereum* – *Eragrostis bicolor* grasslands cover equally large portions of the study area, and are situated in the depressions between the slopes (sensitivity medium-high). These are also part of the Eastern Upper Karoo

vegetation. Runoff and associated sediment and nutrients from surrounding plains accumulate here, resulting in nutrient enriched, clay-rich soils that can hold larger volumes of moisture after rains and generally also support a denser grass layer. During periods of drought, however, topsoils may become excessively dry and the herb layer may recede significantly to exposes large bare patches. These areas are important as grazing areas to the livestock farmers of the region.



**Figure 4:** Wonderheuwel Solar Facility Vegetation unit map.

## 5. SURFACE WATER

Indicate the surface water present on and or adjacent to the site and alternative sites?

Perennial River		NO ✓	
Non-Perennial River	YES ✓		
Permanent Wetland		NO ✓	
Seasonal Wetland		NO ✓	
Artificial Wetland		NO ✓	
Estuarine / Lagoonal wetland		NO ✓	

If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.

A non-Perennial drainage line occurs approx. 500m south of the development footprint, however not on the area demarcated for the PV facility.

## 6. LAND USE CHARACTER OF SURROUNDING AREA

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

<b>Natural area</b> ✓	Dam or reservoir	Polo fields
Low density residential	Hospital/medical centre	Filling station <sup>H</sup>
Medium density residential	School	Landfill or waste treatment site
High density residential	Tertiary education facility	Plantation
Informal residential <sup>A</sup>	Church	<b>Agriculture</b> ✓
Retail commercial & warehousing	Old age home	River, stream or wetland
Light industrial	Sewage treatment plant <sup>A</sup>	Nature conservation area
Medium industrial <sup>AN</sup>	Train station or shunting yard <sup>N</sup>	Mountain, koppie or ridge
Heavy industrial <sup>AN</sup>	Railway line <sup>N</sup>	Museum
Power station	Major road (4 lanes or more) <sup>N</sup>	Historical building
Office/consulting room	Airport <sup>N</sup>	Protected Area
Military or police base/station/compound	Harbour	Graveyard
Spoil heap or slimes dam <sup>A</sup>	Sport facilities	Archaeological site

Quarry, sand or borrow pit	Golf course	**Other land uses (describe)✓
----------------------------	-------------	-------------------------------

\*\*A windmill in the same property.

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? Specify and explain:

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

Does the proposed site (including any alternative sites) fall within any of the following:

Critical Biodiversity Area (as per provincial conservation plan)		<b>NO</b> ✓
Core area of a protected area?		<b>NO</b> ✓
Buffer area of a protected area?		<b>NO</b> ✓
Planned expansion area of an existing protected area?		<b>NO</b> ✓
Existing offset area associated with a previous Environmental Authorisation?		<b>NO</b> ✓
Buffer area of the SKA?		<b>NO</b> ✓

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

## 7. 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 Archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain:	<b>YES</b> ✓
	<b>YES</b> ✓

Mainly isolated surface scatters of Middle Stone Age (MSA) stone artefacts are distributed over the area proposed for the Wonderheuvel Solar Energy Facility on Portion 7 of the Farm Damfontein 114 and the proposed access road. GPS co-ordinate readings were taken to show the extent of the distribution (WH SA1-WH SA7) within the proposed solar energy facility. The stone artefacts were observed on the exposed surface area, the farm road, around the small rocky outcrop and koppie adjacent to the access road. The stone artefacts comprised mainly patinated and heavily weathered flakes and miscellaneous retouched pieces of varying sizes manufactured on a fine-grained (hornfels and lydianite) raw material. It is unlikely that the surface exposed stone artefacts occur *in situ* and are considered to be in a secondary and disturbed context. No other organic or material cultural remains were documented in association with the stone artefacts.

The specialist heritage report contained in **Appendix D2** provides further details.

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

The stone artefact occurrences and scatters are considered as having a medium-low cultural significance. The stone artefact occurrences and scatters have been allocated a General Protection heritage grading as is standard for all archaeological heritage resources (NHRA No 25 of 1999).

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 provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority.

## 8. SOCIO-ECONOMIC CHARACTER

### a) Local Municipality

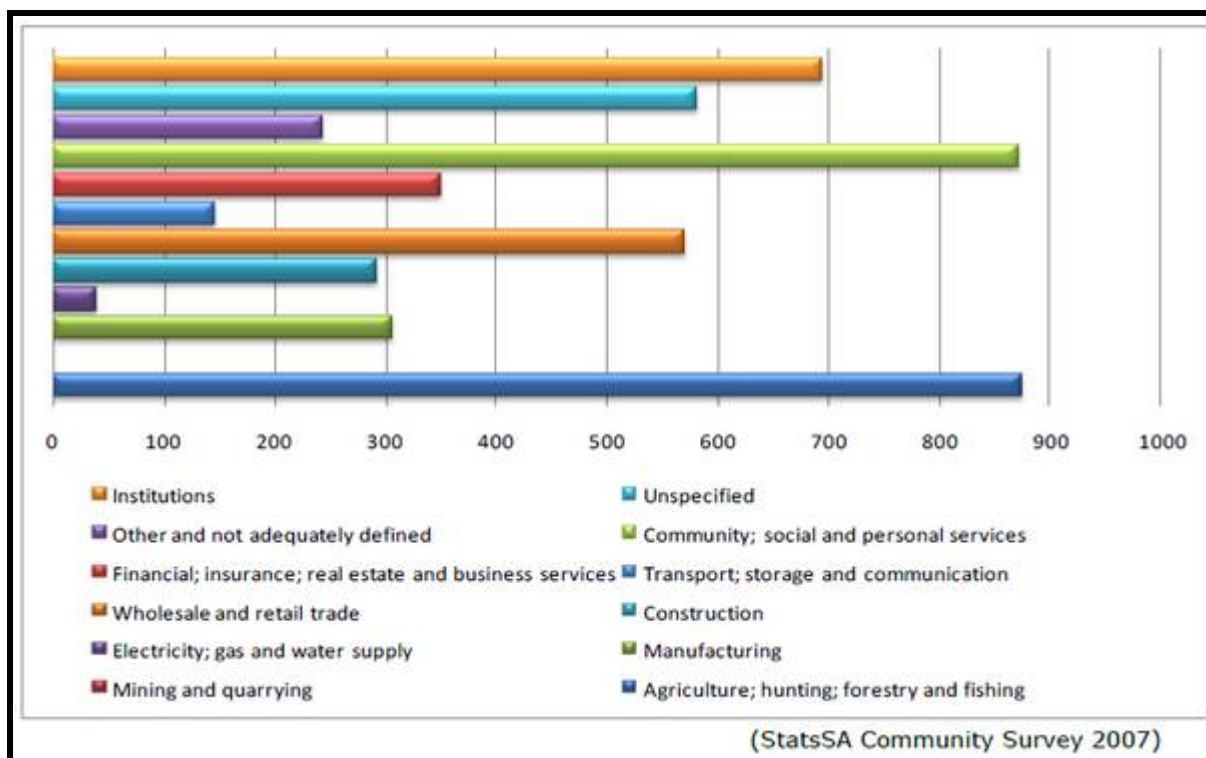
Please provide details on the socio-economic character of the local municipality in which the proposed site(s) are situated.

Level of unemployment:

In 2001 the level of unemployment in the Umsobomvu (UM) LM was 31.12%, which decreased to 25% in 2007. The IDP indicates however, that unemployment is more than 30% in most of the areas and people survive on subsistence farming, pension/welfare

payments and labour intensive jobs. The UM IDP notes the level of unemployment the high unemployment rate has serious repercussions on the ability of the residents of Umsobomvu to pay for service and meet their daily needs.

The agricultural sector is the most important sector in terms of employment, followed by the community, social and personal services including government associations and institutions (**Figure 5**). The IDP also notes that there are a large number of pensioners and retired people are in the urban areas.



**Figure 5: Key economic sectors in terms of employment**

Economic profile of local municipality:

The ULM economy is characterised by the following:

- » High levels of poverty and low levels of education;
- » A declining economy that is largely based on sheep farming;
- » An economy that was too dependent on Spoornet in Noupoort, which has since declined because of the withdrawal of Spoornet;
- » Promising growth in tourism in Colesberg Area;
- » Rapid population growth in Colesberg because of the migration from other parts of the municipal area, which puts a heavy burden on the infrastructure.

Level of education:

In terms of education levels 15.1 % of the population had no education at all, while 71.3% have primary or secondary education. Those with higher educational qualification accounted for 3.7 % of the population. These figures indicate an increase in all categories since 1996, except for the no schooling category, which decreased by 4.9 % indicating a higher percentage of people attending school. In general there has been an improvement in the educational qualifications of the labour force that has a secondary and tertiary education. This would appear to be result of an increase in access to education since 1994, particular, amongst new entrants to the labour force.

**b) Socio-economic value of the activity**

What is the expected capital value of the activity on completion?	R390 million
What is the expected yearly income that will be generated by or as a result of the activity?	R54 million/year
Will the activity contribute to service infrastructure?	<b>YES</b> ✓
Is the activity a public amenity?	<b>NO</b> ✓
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	60-80
What is the expected value of the employment opportunities during the development and construction 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. BIODIVERSITY**

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the



ecosystem status consult <http://bgis.sanbi.org> or [BGIShelp@sanbi.org](mailto:BGIShelp@sanbi.org). Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/ EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as Appendix D to this report.

Refer to Figure 3 in **Appendix D1**

**a) Indicate the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category)**

<b>Systematic Biodiversity Planning Category</b>				<b>If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan</b>
Critical Biodiversity Area (CBA)	Ecological Support Area (ESA)	<b>Other Natural Area (ONA)✓</b>	No Natural Area Remaining (NNR)	

**b) Indicate and describe the habitat condition on site**

<b>Habitat Condition</b>	<b>Percentage of habitat condition class (adding up to 100%)</b>	<b>Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).</b>
Natural		
Near Natural (includes areas with low to moderate level of alien invasive plants)	98%	Relatively good condition
Degraded (includes areas heavily invaded by	0%	

alien plants)		
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	2%	Cultivation, roads, homesteads.

**c) Complete the table to indicate:**

- (i) the type of vegetation, including its ecosystem status, present on the site; and
- (ii) whether an aquatic ecosystem is present on site.

Terrestrial Ecosystems		Aquatic Ecosystems						
<b>Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)</b>	Critical	Wetland (including rivers, depressions, channelled and unchanneled wetlands, flats, seeps pans, and artificial wetlands)			Estuary		Coastline	
	Endangered							
	Vulnerable							
	<b>Least Threatened</b> ✓	<b>YES</b>				<b>NO</b>		<b>NO</b>

**d) Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)**

The study site falls within the Eastern Upper Karoo as described by Mucina and Rutherford (2006). Outcrops and ridges towards the north and north-east of the study area contain Besemkaree Koppies Shrubland, merging slightly into Tarkastad Montane Shrubland that is present north-east of the study area.

The Eastern Upper Karoo landscapes, as described in Mucina and Rutherford (2006) consist of gently sloping plains and flats, interspersed with hills, rocky areas and drainage lines of various sizes. Vegetation is dominated by dwarf microphyllous shrubs and a very variable cover of grasses, dominated by the genera *Aristida* and *Eragrostis*. Local grass cover depends on soil properties (preferring sandier soils), and rainfall. As rainfall is very variable in the Karoo, grass cover within one area can vary significantly from one year to the next.

Prominent tall shrubs include *Lycium cinereum* and *L. horridum*; prominent low shrubs include *Eriocephalus ericoides*, *E. spinescens*, *Pentzia* 0species, *Chrysocoma ciliata*, *Phymaspermum parvifolium*, and *Pteronia* and *Selago* species. The succulent shrub *Ruschia intricata* is widely spread and may reach high localised densities. A wide variety of geophytes occurs in the area, although only visible for short periods after sufficient rains and thus often overlooked or not detected during surveys.

Overall, this vegetation type is regarded as least threatened and is the largest mapped vegetation unit within South Africa, with up to date an estimated 2% of the vegetation being transformed due to various developments (Mucina and Rutherford 2006), but larger areas may be in various states of degradation (Hoffman and Ashwell 2001, Esler *et al.* 2006). A large factor contributing to this widespread degradation is erosion, with up to 60% of landscapes within the vegetation type being affected by moderate erosion, the remainder by high erosion rates, thus also leading to changes in vegetation composition and requiring active management to combat and reverse degradation. (Refer to **Appendix D1**).

## SECTION C: PUBLIC PARTICIPATION

### 1. ADVERTISEMENT AND NOTICES

<b>Publication name</b>	Volksblad and De Aar Echo	
<b>Date published</b>	<ul style="list-style-type: none"> <li>• 26 October 2012 and 02 December 2012 (Project announcement)</li> <li>• 09 December 2012 (announcement of availability of DBAR and Public Open Day)</li> </ul>	
<b>Site notice position</b>	<b>Latitude</b>	<b>Longitude</b>
	31° 9'26.86"S	24°49'21.86"E
<b>Date placed</b>	29 October 2012	

Include proof of the placement of the relevant advertisements and notices in **Appendix E1**.

### 2. DETERMINATION OF APPROPRIATE MEASURES

Provide details of the measures taken to include all potential I&APs as required by Regulation 54(2)(e) and 54(7) of GN R.543.

The public consultation process has included the publishing of notices regarding the proposed project as well as the distribution of notification letters to identified I&APs. Affected and neighbouring landowners will be consulted through one-on-one consultation sessions and via telephone. A public open day was held within the study area during the review period of the Draft Basic Assessment report in order to provide feedback regarding the findings of the study; this was advertised in the local and regional press. All identified I&APs were invited to attend.

Key stakeholders (other than organs of state) identified in terms of Regulation 54(2)(b) of GN R.543):

<b>Title, Name and Surname</b>	<b>Affiliation/ key stakeholder status</b>	<b>Contact details (tel number or e-mail address)</b>
Christiaan Philippus	Adjacent Landowner	
Jim De Villiers	Adjacent Land Owner	
Handre Nieuwoudt	Impacted Land Owner	
Hendrikus Visser	Adjacent Land Owner	
Henk Du Toit	Adjacent Land Owner	
Andries Keun	Impacted Land Owner	

Jim De Villiers	Adjacent Land Owner	
Anita Geldenhuis	Adjacent Landowner	
Septimus Van Dyk	Adjacent Landowner	
Fauntleroy Gillmer	Impacted Land Owner	
Jim De Villiers	Adjacent Land Owner	
Dykie De Villiers	Adjacent Land Owner	
Colin Bowes	Adjacent Land Owner	
Jim De Villiers	Adjacent Land Owner	
Pieter Langenhoven	Adjacent Landowner	
Pam Barret	I&AP	
Suzanne Erasmus	I&AP	

Include proof that the key stakeholder received written notification of the proposed activities as **Appendix E2**. This proof may include any of the following:

- e-mail delivery reports;
- registered mail receipts;
- courier waybills;
- signed acknowledgements of receipt; and/or
- or any other proof as agreed upon by the competent authority.

### 3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summary of main issues raised by I&APs	Summary of response from EAP
SKA assessed the project location the proposed side and determined that it is of a low risk to the SKA infrastructure because the solar energy project is more than 100km away from the SKA project infrastructure.	Comment noted, no response required.
Department of Agriculture, Forestry & Fisheries commented that since they are no protected trees that will be affected by the proposed development; the Department has no objection against the proposed development as long as the necessary permits are obtained from the provincial Department of Environment and Nature Conservation for the disturbance of specially protected fauna and flora.	If permit for the disturbance of specially protected fauna and flora is required, it will be obtained from DENC.
BirdLife South Africa commented that the	An avifaunal report for solar project near

<p>proposed solar farm and associated infrastructure have the potential to cause significant habitat loss, displacement and possibly mortality of avifauna.</p>	<p>Noupoort has been done. The report was submitted to BirdLife. Additional comment from BirdLife is awaited.</p>
<p>The general community of Noupoort were concerned about job prospects the development of the solar energy facility would bring to the area.</p>	<p>The project will create employment opportunities. Approximately 60 – 80 jobs will be created per project during the construction phase. Twenty permanent jobs would be created during the operational phase.</p>
<p>Umsobomvu Local Municipality queried whether the proposed substation would still be constructed regardless of all the various Terrasolar projects being developed.</p>	<p>The alternative would be to connect to the existing power line. This would, however, depend on the grid capacity and Eskom.</p> <p>Detailed grid integration studies are being undertaken by the developer. It is possible, that the Newgate substation will not have sufficient capacity to accommodate all 5 projects, therefore a new substation is proposed. At this point the aim is to secure the land for development of the substation and obtain Environmental Authorisation, in the event that is required, this is also dependent on Eskom’s input.</p>

#### 4. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments received from I&APs and respond to each comment before the Final BAR 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 the Final BAR as **Appendix E3**.

#### 5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

Authority/Organ of State	Title	Contact person (Name and Surname)	Tel No	Fax No	e-mail
Council for Scientific and Industrial Research	Mr.	Paul Lochner	021-888-2486		plochner@csir.co.za
Department of Agriculture, Forestry & Fisheries	Ms	Thoko Buthelezi	012-319-7634		thokob@daff.gov.za
Department of Agriculture, Forestry & Fisheries	Ms	Jacoline Mans	054-338-5909	054-334-0030	jacolinema@daff.gov.za
Department of Energy	M	The Director: Northern Cape	053-807-1752	086-562-7065	
Department of Energy		DDG: Programmes and Projects	012-406-7568		
Department of Mineral Resources	Mr	Ntsundeni Ravhugoni	053-807-1700	053-830-0827	Ntsundeni.Ravhugoni@dmr.gov.za
Department of Rural Development and Land Reform	Ms	Debbie Khan	012-312-9490	012-323-6072	dkhan@ruraldevelopment.gov.za
Department of Water Affairs	Mr	A Abrahams		053-831-4534	abrahamsa@dwa.gov.za
Department of Water Affairs	Ms.	Tocky Ngobeni	012-336-7488		ngobenit@dwa.gov.za
Eskom	Mr.	John Geeringh	011-516-7233	086-661-4064	john.geeringh@eskom.co.za
Eskom	Mr.	Andrea van Gensen	051-404-2040		andrea.vangensen@eskom.co.za
Northern Cape Department of Agriculture, Land Reform & Rural Development	Mr.	Ali Diteme	053-838-9106	053-832-4328	aditeme@agri.ncape.gov.za
Northern Cape Department of Environment and Nature Conservation	Ms.	J Mutyorauta	053-807-7431		jmutyorauta@ncpg.gov.za
Northern Cape Department of Environment and Nature Conservation	Mr	Denver van Heerden	053-807-7305	053-807-7367	jriddles@ncpg.gov.za
Northern Cape Department of Environment and Nature Conservation	Ms	Christene Pienaar	053-807-7437	053-807-7416	
Northern Cape Department of Roads and Public Works	Ms	Kholikile Nogwili	053-838-2109	053-838-2117	lucindavanwyk@ncpg.gov.za

Northern Cape Department of Roads and Public Works	Mr.	Kenneth Markman	053-631-1355	053-631-1357	kenneth.markman@vodamail.co.za
Northern Cape Provincial Heritage Resources Agency	Mr.	Andrew Timothy	053-831-2537	053-833-1435	ratha.timothy@gmail.com
Northern Cape Rock Art Trust (NCRA) McGregor Museum	Ms.	David Morris	053-839-2706	053-842-1433	dmorris@inext.co.za
Pixely Ka Seme District Municipality	Mr.	Simphiwe Naude	053-631-0891	053-631-0891	
Pixely Ka Seme District Municipality	Mr.	Maccollan Jack	053-631-0891	053-631-2529	mackjack@vodamail.com
Pixely Ka Seme District Municipality	Mr.	Sandisile Madayo	053-632-9100	052-631-0105	pixley@telkomsa.net
South African Civil Aviation Authority	Mr.	Chris Isherwood	011-545-1028	011-545-1282	isherwoodc@caa.co.za
South African Heritage Resources Agency (SAHRA)	Mr.	Kathryn Smuts	021-462-4502	021-462-4509	ksmuts@sahra.org.za
South African Heritage Resources Agency (SAHRA)	Ms	Mariagrazia Galimberti	021-462-4502	021-462-4509	mgalimberti@sahra.org.za
South African National Parks	Mr.	Peter Novellie	012-426-5066		peter.novellie@sanparks.org
South African National Parks	Mr.	Paul Daphne	012-426-5066	012-343-2832	pauld@sanparks.org
South African National Roads Agency Limited	Ms.	Rene de Kock	021-957-4607	021-946-1630	Dekockr@nra.co.za
South African National Roads Agency Limited	Ms.	Colene Runkel		021-946-1630	runkelc@nra.co.za
Square Kilometre Array (SKA): South Africa	Dr.	Adrian Tiplady	011-442-2434		atiplady@ska.ac.za
Transnet	Mr.	Krishna Reddy	011-308-1065	011-308-2638	krishna.reddy@transnet.net
Umsobomvu Local Municipality	Mr.	Mzawandile Toto	049-843-1056	049-843-1947	mzwandiletoto@gmail.com
Umsobomvu Local Municipality	Mr.	MA Sestile	049-843-1165	049-843-1165	ma.sestile@webmail.co.za
Umsobomvu Local Municipality	Mr.	Manne Rossouw	051-753-0574	051-753-0574	manne@umsobomvumun.co.za
Umsobomvu Local Municipality	Mr.	Ben Malherbe	051-753-0777	051-753-0574	faith@umsobomvu



					mun.co.za
Umsobomvu Local Municipality	Cllr	Annie Fritz	049-843-1219		
Umsobomvu Local Municipality	Cllr	Amos China Mpela	051-753-0777	051-753-1918	
Wildlife and Environment Society of South Africa (WESSA)	Ms	Suzanne Erasmus	053-839-2717	053-842-1433	wessanc@yahoo.com

Include proof that the Authorities and Organs of State received written notification of the proposed activities as **Appendix E4**.

In the case of renewable energy projects, Eskom and the SKA Project Office must be included in the list of Organs of State.

## **6. CONSULTATION WITH OTHER STAKEHOLDERS**

Note that, for any activities (linear or other) 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. Application for any deviation from the regulations relating to the public participation process must be submitted prior to the commencement of the public participation process.

A list of registered I&APs is included as **Appendix E5**.

Copies of any correspondence and minutes of any meetings held must be included in **Appendix E6**.

## **SECTION D: IMPACT ASSESSMENT**

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

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

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts 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. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A (2) of this report.

Activity	Impact summary	Significance	Proposed mitigation
<b>Alternative 1 (preferred alternative)</b>			
Construction of PV array, access roads and associated infrastructure.	<p><b><u>Ecology</u></b>  <b><i>Direct impacts:</i></b></p> <ul style="list-style-type: none"> <li>» Loss of vegetation, increase in runoff and erosion through upgrading of access road.</li> <li>» Loss of vegetation and living soil crusts, loss of and alteration of microhabitats, altered vegetation cover, altered distribution of rainfall and resultant runoff patterns, increase in runoff and accelerated erosion during construction and operation of PV panels.</li> <li>» Loss of vegetation, loss of micro-habitat, increase in runoff and erosion, window of opportunity for the establishment of alien invasive species, absence of living soil crusts, altered topsoil characteristics with low moisture infiltration capacity and increased runoff during fencing area of the area.</li> <li>» Loss of vegetation, increase in runoff and erosion during the construction of power line to substation.</li> <li>» Potential collision and electrocution of the blue cranes species found in the area with the overhead power line.</li> </ul>	Medium-Low	<ul style="list-style-type: none"> <li>» Make use of existing tracks as far as possible</li> <li>» Ensure an adequate plant search and rescue program prior to commencement of activity</li> <li>» Minimise area affected, especially during construction</li> <li>» Use topsoils removed for redistribution outside the lowest borders of the development to stop erosion off the cleared areas</li> <li>» Remove and collect all succulent and bulbous plants from cleared areas and transplant onto the newly redistributed topsoils</li> <li>» Ensure bird-friendly tower designs are implemented to minimise the risk of electrocutions. Fit overhead power lines with appropriate flappers to increase the visibility thereof to avifauna. Notes of electrocution and collision events must be sent to a qualified Ornithologist for the recommendation of further mitigation measures if necessary.</li> <li>» Install bird diverters on the power line.</li> </ul>

Activity	Impact summary	Significance	Proposed mitigation
	<p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>» Ecological degradation/loss of ecological integrity.</li> </ul>	<p>Medium</p>	<ul style="list-style-type: none"> <li>» Prevent pollution of the environment;</li> <li>» Re-establish vegetation where possible and in so doing increasing habitat capabilities;</li> <li>» Implement an invasive/exotic species eradication programme.</li> </ul>
	<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>» Possible erosion of areas lower than the access road, possible contamination of lower-lying drainage lines due to oil or other spillage,</li> <li>» Possible spread and establishment of alien invasive species</li> <li>» Possible excessive fragmentation and thus reduction of core habitats that may negatively influence species population viability.</li> </ul>	<p>Medium-Low</p>	<ul style="list-style-type: none"> <li>» Cumulative impacts of developments on population viability of species can be reduced significantly if new developments are kept as close as possible to existing developed areas or, where such is not possible, different sections of a development be kept as close together as possible. Thus new power lines should follow routes of existing servitudes if such exist, renewable energy facilities should be constructed as close as possible to existing infrastructure or substations, and if several developments are planned within close proximity, these developments should be situated as close together as possible, not scattered throughout the landscape.</li> </ul>

Activity	Impact summary	Significance	Proposed mitigation
Placement of solar panels; underground cabling; overhead power line; additional internal access roads, and the workshop area	<p><b><u>Heritage Impacts</u></b>  <b><i>Direct impacts:</i></b>                      » The destruction stone artefact occurrences and scatters.</p>	Medium	» 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 and/or the South African Heritage Resources Agency (SAHRA) so that systematic and professional investigation/ excavation can be undertaken. » Construction managers/foremen should 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.
	<p><b><i>Indirect impacts:</i></b>                      » Irreplaceable loss of archaeological heritage resources.</p>	Low	Same as above
	<p><b><i>Cumulative impacts:</i></b>                      » Irreplaceable loss of archaeological heritage resources.</p>	Low	Same as above
Construction of the PV array, access roads and associated infrastructure.	<p><b><u>Soil &amp; Agricultural Impacts</u></b>  <b><i>Direct impacts:</i></b>                      » Siltation of watercourses and other natural resources downstream as a result of improper storm water management and soil erosion due to increased and concentrated water run-off                      » Dust production and dust pollution of</p>	Medium-Low	Care must be taken with the ground cover during and after construction on the site. If it is not possible to retain a good plant cover during construction, techniques should be employed to keep the soil covered by other means, i.e. straw, mulch, erosion control mats, etc., until a healthy plant cover is again established. Care should also be taken to control and contain stormwater run-

Activity	Impact summary	Significance	Proposed mitigation
	grazing plants » Soil erosion on construction sites during and after the construction phase due to decreased vegetation cover and increased water run-off		off. Rehabilitate construction sites by establishing it with indigenous grasses.
	<p><b>Indirect impacts:</b>                      Limited with the necessary mitigation in place</p>	Low	See mitigation of direct impacts
	<p><b>Cumulative impacts:</b>                      » The site is located outside watercourses; however runoff does accumulate on lower-lying areas where it may remain without draining further after smaller rainfall events. During such time soils of these clay-rich valleys become almost marshy and impossible to cross by vehicle, until the soils have dried out again.</p>	Low	Care must be taken with the ground cover during and after construction on the site. If it is not possible to retain a good plant cover during construction, techniques should be employed to keep the soil covered by other means, i.e. straw, mulch, erosion control mats, etc., until a healthy plant cover is again established.
<p><b>Construction phase</b>                      (Including all related infrastructure such as transmission lines, access roads, office and warehouse components) and  <b>Operational phase</b></p>	<p><b>Direct impacts:</b>  <b>Positive social impacts:</b>                      » Creation of employment and business opportunities (Based on information from the developer 2 fulltime and 18 part time employment opportunities for the 20 year life of the project). The operational phase will also create opportunities for skills development and training.</p>	Low	» Where possible, Wonderheuwel Solar Energy should make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically semi and low-skilled job categories. This will reduce the potential impact that this category of worker could have on local family and social networks. » Maximise the use of local labour for low – semi skilled jobs far as possible.

Activity	Impact summary	Significance	Proposed mitigation
	<p>» Benefits associated with the establishment of a local community trust;</p> <p>» The establishment of renewable energy infrastructure.</p> <p><b>Potential negative impacts:</b></p> <p>» The visual impacts and associated impact on sense of place</p> <p>» Influx of construction workers employed on the project;</p> <p>» Increased risk of stock theft, poaching and damage to farm infrastructure associated with construction workers;</p> <p>» Increased risk of veld fires associated with construction related activities;</p> <p>» Impact of heavy vehicles, including damage to roads, safety, noise and dust;</p> <p>» Loss of agricultural land associated with construction related activities.</p>		
	<p><b>Indirect impacts:</b></p> <p>» Once the construction phase is complete, locals may not be able to find future employment.</p> <p>» Alternatively local employed during the construction phase may learn new skills thereby making them more employable in the future.</p>	Low	The developer should implement a training and skills development programme for locals during the first 5 years of the operational phase. The aim of the programme should be to maximise the number of South African's and locals employed during the operational phase of the project.



Activity	Impact summary	Significance	Proposed mitigation
	<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>» The development of additional renewable energy facilities in the region may serve to increase the potential for job creation.</li> <li>» Impacts on family and community relations that may, in some cases, persist for a long period of time. Also in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community.</li> </ul>	<p>Low</p>	<ul style="list-style-type: none"> <li>» Attention should be given to the extension and improvement of the existing HIV/Aids awareness programmes.</li> </ul>
<p>Operation Phase - visibility of the PV arrays, access roads, substation and power line.</p>	<p><b>Visual Impacts</b>  <b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>» Potential visual impact on the sensitive receptors in the background. (i.e. within 3km of the facility).</li> <li>» Potential visual impact on the intrinsic value and sense of place of the Noupoort region.</li> <li>» Potential visual impact of artificial lighting as a result of the activity.</li> </ul>	<p>Low</p>	<ul style="list-style-type: none"> <li>» Keep disturbed areas to a minimum.</li> <li>» No clearing of land to take place outside the demarcated footprint.</li> <li>» Institute a planting regime around the boundaries of the project site to shield the PV plant from any potential views onto it from the view corridors. Only indigenous plant species to be introduced and planted in such a manner and location which would not cast shadows on the PV arrays.</li> <li>» Buildings and similar structures must be in keeping with regional planning policy</li> </ul>

Activity	Impact summary	Significance	Proposed mitigation
			<p>documents, especially the principles of critical regionalism, namely sense of place, sense of history, sense of nature, sense of craft and sense of limits.</p> <p>» Utilise existing roads and tracks to the extent possible. Where new roads are required, they should be two-track gravel roads, maintained to prevent dust and erosion.</p>
	<p><b>Indirect impacts:</b></p> <p>» The proposed infrastructure is of such a nature that the status quo could be regained after decommissioning of the plant.</p>	Low	Providing that the site is rehabilitated to its current state, the visual impact will also be removed.
	<p><b>Cumulative impacts:</b></p> <p>» The introduction of the PV plant, coupled with the transmission lines and proposed substation will contribute to an increased cumulative visual impact.</p>	Medium	Provided that the footprint of the individual sites is not enlarged and their positions remain as planned, the cumulative impact of the proposed activity is regarded to be insignificant.
During construction, operation and maintenance activities	<p><b>Avifaunal Impacts</b></p> <p><b>Direct impacts:</b></p> <p>» Destruction of Blue Crane habitat during construction</p> <p>» Disturbance of Blue Cranes during construction and maintenance</p> <p>» Collision of Blue Cranes with overhead power lines</p>	Low	<p>» Avoid sensitive areas of site as identified in the avifaunal walk through as part of the site specific EMP.</p>

Activity	Impact summary	Significance	Proposed mitigation
	<b>Indirect impacts:</b> Blue Crane species migrating to other areas	Low-medium	» Avoid sensitive areas of site as identified in the avifaunal walk through as part of the site specific EMP.
	<b>Cumulative impacts:</b> Could be quite substantial if more projects are built in the same area. Collectively these facilities could remove quite a lot of habitat from the area. However on a landscape level this is still not believed to be significant in this area.	Low	» Avoid sensitive areas of site as identified in the avifaunal walk through as part of the site specific EMP.
<b>Alternative 2</b>			
	<b>Direct impacts:</b>		
	<b>Indirect impacts:</b>		
	<b>Cumulative impacts:</b>		
<b>Alternative 3</b>			
	<b>Direct impacts:</b>		
	<b>Indirect impacts:</b>		
	<b>Cumulative impacts:</b>		
<b>No-go option</b>			
Construction,	<b>Direct impacts:</b>	Low	None

Activity	Impact summary	Significance	Proposed mitigation
operation and decommissioning phase of the solar energy facility	<p>The negative impacts for the project include:</p> <ul style="list-style-type: none"> <li>» Clearing of natural vegetation for the proposed footprint area, increasing the potential for soil erosion, deterioration of the biotic, abiotic and economic properties of soil, and the long-term loss of natural vegetation;</li> <li>» Possible destruction of stone artefact occurrences and scatters. That are scattered over the extent of the proposed Wonderheuwel Solar Energy Facility area and within the existing site access that is proposed to be used as the access road for the project.</li> </ul> <p>The positive impacts for the project include:</p> <ul style="list-style-type: none"> <li>» 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.</li> <li>» 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,</li> </ul>		

Activity	Impact summary	Significance	Proposed mitigation
	<p>and for cementing its status as a leading player within the international community.</p> <ul style="list-style-type: none"> <li>» Employment creation: The sale, development, installation, maintenance, and management of renewable energy facilities have significant potential for job creation in South Africa.</li> <li>» Acceptability to society: Renewable energy offers a number of tangible benefits to society including reduced pollution concerns, improved human, and ecosystem health.</li> <li>» Support to a new industry sector: The development of renewable energy offers the opportunity to establish a new industry within the South African economy.</li> <li>» 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.</li> </ul> <p>Also referred to as the 'Do nothing' option, this refers to Wonderheuwel Solar Energy</p>		

Activity	Impact summary	Significance	Proposed mitigation
	<p>(Pty) Ltd not constructing the proposed solar energy facility on the identified site. 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. There are no insurmountable environmental or social constraints that prevent the establishment of the proposed Wonderheuwel Solar Energy Facility; therefore the No-Go option is not preferred.</p>		
	<p><b>Indirect impacts:</b>                      The No-Development option would represent a lost opportunity for South Africa to supplement its current energy needs with clean, renewable energy. Given South Africa's position as one of the highest per capita producer of carbon emissions in the world, this would represent a high negative social cost.</p>	Low	None
	<p><b>Cumulative impacts:</b>                      Contributing to further unemployment and unsustainable ways to produce electricity.</p>	Low	None

A complete impact assessment in terms of Regulation 22(2)(i) of GN R.543 must be included as **Appendix F**.

## **2. 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.

### **Alternative A (preferred alternative)**

This section provides a summary of the environmental 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

temporary and permanent drainage works as soon as possible and by taking other measures necessary to prevent the surface water from being concentrated in streams and from scouring the slopes, banks or other areas. Stabilisation of cleared areas to prevent and control erosion needs to be actively managed. The method of stabilisation shall be determined in consultation with the ECO.

- » The overall area is of **medium cultural (archaeology) sensitivity**; surface scatters of mainly Middle Stone Age (MSA) stone artefacts extend over the extent of the proposed Wonderheuwel Solar Energy Facility area and within the existing that is proposed to be used as the access road for the project. No associated archaeological material or organic remains were documented with the stone artefact surface scatters. No other archaeological heritage remains, features or sites were observed within the area proposed for development. The proposed development would have negative implications on the archaeological heritage remains documented within the proposed area during all phases of the development. The recommendations must be considered as appropriate mitigation measures to protect and conserve the archaeological heritage remains observed within the proposed development area and further archaeological remains that may occur and are not immediately visible on the surface. The following recommendations must be considered:
  - \* Once the final layout (including the positions of the solar panels; underground cabling; overhead power line; additional internal access roads, and the workshop area) of the proposed Wonderheuwel Solar Energy Facility has been finalised an archaeological ground-truthing should be conducted and further recommendation be made to protect the archaeological heritage within the area proposed for development; and / or
  - \* 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 and/or the South African Heritage Resources Agency (SAHRA) so that systematic and professional investigation/ excavation can be undertaken.
  - \* Construction managers/foremen should 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.
  
- » With regards to **palaeontology** (fossils), the area is characterised by fossiliferous mudstones and sandstones. Several dolerite sills and dykes occur in the region and are often found capping hills and forming ridges. Care should be given however to constructions such as access routes, construction facilities, substations, pylons and buildings which are not limited to dolerite. There is a high probability that fossils would occur on the Wonderheuwel site where construction is proposed due to the mudstone which dominates the study site. It is recommended that a palaeontologist should be appointed do a pre-construction site visit to determine whether fossils are exposed in the area earmarked for development. This survey



would of course be limited to a surface inspection only. In the event of fossils being uncovered during the construction phase, the ECO should photograph and record the position of fossiliferous material.

- » The results of the **Visual Impact Assessment** found that the proposed activity will have a **low** visual impact from all key Observation Points. Due to its remoteness and separation from most sensitive receptors, all but one of the receptors is located in the background of the project. All of the potential impacts therefore relate to the middle- and background zone of visual influence. The visual analysis and assessment from all of these observation points found that the proposed activity is unrecognisable from the relevant Observation Points.
- » The overall **social impact** of the project is likely to be of a predominantly **low significance (positive impact)** with the implementation of appropriate enhancement measures. The project will create employment and business opportunities for locals during both the construction and operational phase of the project. The majority of the potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. However, the impact on individuals who are directly impacted on by construction workers and or job seekers (i.e. contract HIV/ AIDS) was assessed to be of Medium-High negative significance. In addition, due to the low population density of the area and the relatively small size of the labour force the potential risk to local family structures and social networks is regarded as low. The establishment of a Community Trust also creates an opportunity to support local economic development in the area. The proposed development also represents an investment in clean, renewable energy infrastructure, which, given the challenges created by climate change, represents a positive social benefit for society as a whole.
- » The overall impact on **avifauna** is likely to carry **low significance** due to the limited area that is taken up by the facilities and the relative uniformity of the habitat in the broader area. It will be necessary to check for such breeding just prior to the onset of construction. It is recommended that a final avifaunal walk-through be conducted as part of the site specific EMP for the projects.

Based on the findings of the studies undertaken, in terms of environmental constraints and opportunities identified through the Environmental Basic Assessment process, no environmental impacts of high significance, and no fatal flaws were identified to be associated with the establishment of the proposed Wonderheuwel Solar Energy (Pty) Ltd and associated infrastructure.

The significance levels of the majority of identified negative impacts can generally be reduced by implementing the recommended mitigation measures. With reference to the information available at this planning approval stage in the project cycle, the confidence in the environmental assessment undertaken is regarded as acceptable.

Therefore, it is recommended that the project should be authorised. However, a number of issues requiring mitigation have been highlighted in the impact assessment (Appendix F). In response to these potential environmental impacts, environmental specifications for the management of these issues / impacts are detailed within the Final Environmental Management Programme (EMP) included within Appendix G.

### **No Go Alternative (Compulsory)**

Also referred to as the 'Do nothing' option, this refers to Wonderheuwel Solar Energy (Pty) Ltd not constructing their proposed solar energy facility on the identified site. 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 20 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.
- » **Exploitation of South Africa's 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 (December 2003), which has set a target of 17GW renewable energy contributions to final energy generation mix by 2030. The target is to be achieved primarily through the development of solar, biomass, solar and small-scale hydro.

The No-Development option would represent a lost opportunity for South Africa to supplement its current energy needs with clean, renewable energy. Given South Africa's position as one of the highest per capita producer of carbon emissions in the world, this would represent a High negative social cost.

The no-development option also represents a lost opportunity in terms of the employment and business opportunities (construction and operational phase) associated with the proposed solar thermal plant and the benefits associated with the establishment of a Community Trust. This also represents a negative social cost.

**The 'Do nothing' alternative is, therefore, not a preferred alternative.**

## SECTION E: RECOMMENDATION OF 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 ✓

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).

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.

There are no insurmountable environmental or social constraints that prevent the establishment of the proposed Wonderheuwel Solar Energy Facility. However, several sensitive areas / features (see **Figure 6**) were identified on the site as follow:

- » Natural vegetation (ie *Diospyros austro-africana* - *Stipagrostis obtuse*) on low rocky ridges and outcrops;
- » Heritage sites i.e. Middle stone age artefact

The Ecological sensitivity of the site is rated as follows:

- » High ecological sensitivity - *Diospyros austro-africana* - *Stipagrostis obtusa* on low rocky ridges and outcrops, PV panels, other infrastructure and new tracks grid connection Pylons to avoid areas where possible. Also drainage line are treated as drainage lines to be treated as No Go, ensure flow of water is not altered by access roads that may have to traverse these lines, ensure grid connection pylons stay at least 32 m from banks and overhead lines are fitted with bird-flappers
- » Medium-high ecological sensitivity – Very dynamic system that can turn into impassable marshes after sufficient rains. Important grazing areas and possibly Blue Crane foraging habitat. Restrict development to access routes, avoid crossing by power lines as much as possible, no PV or other infrastructure development.
- » Medium-low ecological sensitivity - PV, infrastructure, road development possible with mitigation measures. Developments should be clustered together as much as possible to prevent excessive fragmentation of the ecosystem

The location for the proposed solar energy facility and associated infrastructure has been selected to avoid the above-mentioned sensitive areas which are acceptable in terms of impact avoidance, rather than mitigation.

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:**

- » All relevant practical and reasonable mitigation measures detailed within this report and the specialist reports contained within Appendix D must be implemented.
- » The Final Environmental Management Programme (EMP) as contained within Appendix G of this report should form part of the contract with the Contractors appointed to construct and maintain the proposed solar energy facility, and will be used to ensure compliance with environmental specifications and management measures. The implementation of this EMP for all life cycle phases of the proposed project is considered to be key in achieving the appropriate environmental management standards as detailed for this project.
- » During construction, unnecessary disturbance to habitats should be strictly controlled and the footprint of the impact should be kept to a minimum.
- » Perennial grasses which occur naturally in the area should be used to stabilise the site after it has been cleared. A mix of fast growing annual and perennial grass species could be used, which could include species such as *Cynodon dactylon* and *Cenchrus ciliaris*, which are readily available and easily established.
- » Disturbed areas should be rehabilitated as soon as possible once construction is complete in an area.
- » An on-going monitoring programme should be established to detect and quantify any alien species.
- » Identify areas of high erosion risk (drainage lines, existing problem areas). Only special works to be undertaken in these areas to be authorised by ECO and Engineer's representative (ER).
- » Access roads to be carefully planned and constructed to minimise the impacted area and prevent unnecessary degradation of soil.
- » Erosion control measures- run-off control and attenuation on slopes (sand bags, logs), silt fences, stormwater channels and catch-pits, shade nets, soil binding, geofabrics, hydroseeding or mulching over cleared areas.
- » 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 SAHRA so that systematic and professional investigation/ excavation can be undertaken. It is also recommended that a palaeontologist should be appointed do a site visit to determine whether fossils are

exposed in the area earmarked for development, prior to construction. This survey would of course be limited to a surface inspection only. In the event of fossils being uncovered during the construction phase, the ECO should photograph and record the position of fossiliferous material.

- » An application for all other permits (e.g. those with respect to protected tree species or protected plant species) must be obtained from 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. Due to the high risk of Blue Crane collision, all power line for these sites and the grid connection from the site substation to the Eskom substation should be built underground, if possible.
- » The Conservation Authorities of the Northern Cape need to be contacted regarding any permit regulations that need to be followed regarding the removal of the above species. It is preferable that whenever any of the species need to be removed, they be replanted whenever feasible (succulents and geophytes) to sites nearby in the same type of habitat, but remaining on the same land portion.
- » Limit construction, maintenance, and inspection activities to dry periods.
- » Develop emergency maintenance operational plan to deal with any event of contamination, pollution, or spillages.
- » 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.
- » Locals should be provided an opportunity to be included in a list of possible local suppliers and service providers.
- » Social benefits in terms of training, skills development and the use of local labour should thus be aspired to. These skills can be transferable to other employment sectors and would result in further sustainable benefits.
- » The Umsobomvu Local Municipality and community representatives and neighbouring property owners should be kept informed of the progress, decisions taken with regards to the development and construction schedules. The establishment of a community Management and Monitoring Committee consisting of key community representatives, and representatives of the Umsobomvu Local Municipality could assist in this regard.
- » Attention should be given to the extension and improvement of the existing HIV/Aids awareness programmes.
- » Compile and implement a detailed waste management plan.
- » Compile and implement a traffic management plan.
- » Compile and implement a storm water management plan.

**Operation Phase:**

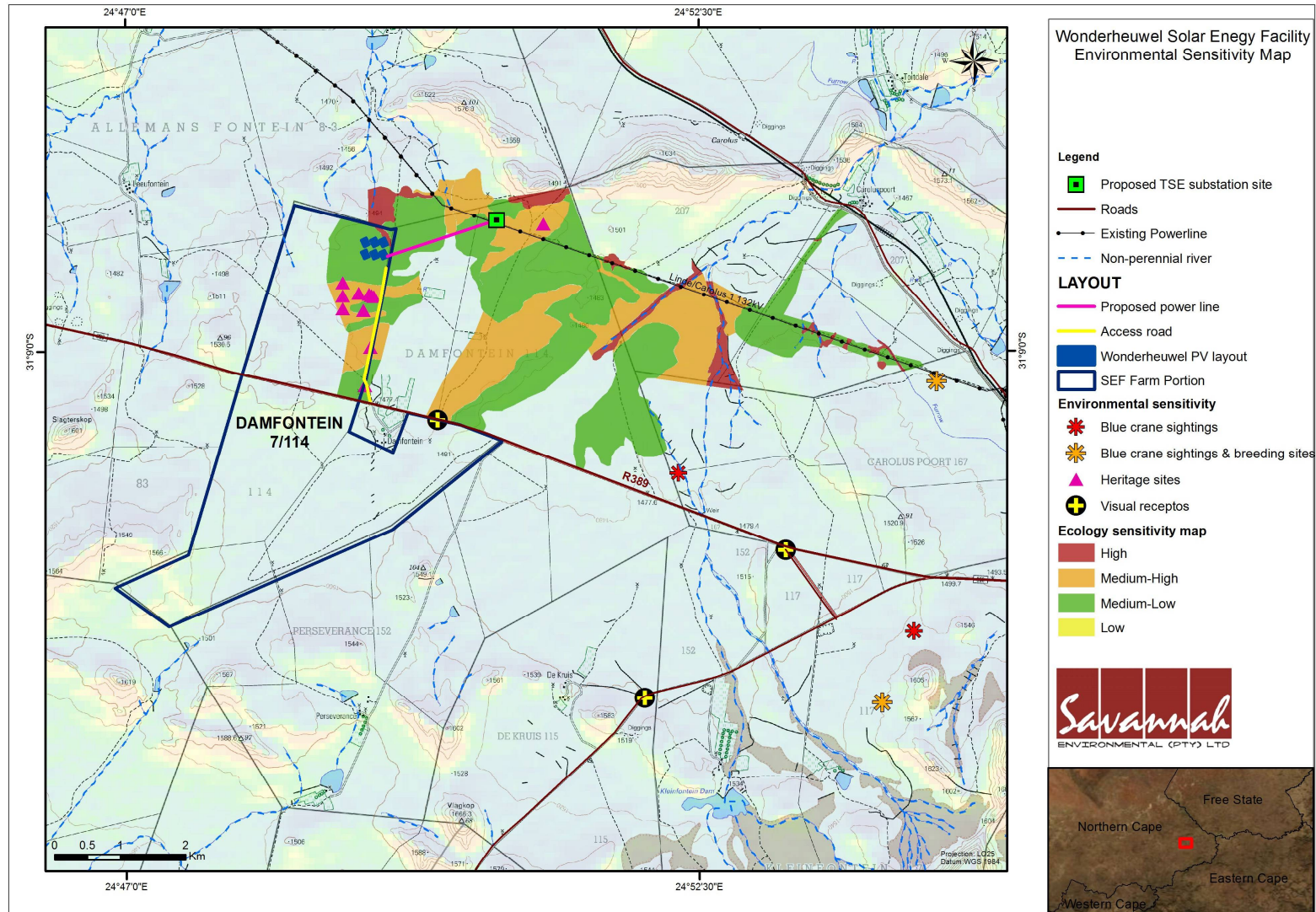
The mitigation and management measures previously listed in this Basic Assessment Report should be implemented in order to minimise potential environmental impacts. The following mitigation measures should also be implemented.

- » Maintenance of erosion control measures (i.e. berms).
- » Ensure bird-friendly tower designs are implemented to minimise the risk of electrocutions. Fit overhead power lines with appropriate flappers to increase the visibility thereof to avifauna. Notes of electrocution and collision events must be sent to a qualified Ornithologist for the recommendation of further mitigation measures if necessary.
- » Install bird diverters on the power line.
- » Development and implementation of a storm water management plan.
- » On-going maintenance of the facility to minimise the potential for visual impacts.
- » On-going monitoring of the site to detect and restrict the spread of alien plant species.
- » Training, skills development and the use of local labour.

Is an EMPr attached?

YES ✓

The EMPr must be attached as **Appendix G.**



**Figure 6:** Environmental Sensitivity Map for the Wonderheuwel Solar Energy Facility



The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as **Appendix H**.

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in **Appendix I**.

Any other information relevant to this application and not previously included must be attached in **Appendix J**.

\_\_\_\_\_  
NAME OF EAP

\_\_\_\_\_  
SIGNATURE OF EAP

\_\_\_\_\_  
DATE

## **SECTION F: APPENDICES**

The following appendixes must be attached:

Appendix A: Maps

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports (including terms of reference)

Appendix E: Public Participation

Appendix F: Impact Assessment

Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise

Appendix I: Specialist's declaration of interest

Appendix J: Additional Information