Environmental Impact Assessment
Draft Basic Assessment Report

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Reg No: 2014/017865/07

WOODLAND HILLS PV SOLAR FARM

DESTEA REF: to be provided

DATE: MAY 2023

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setala

Disclaimer

The opinions expressed in this report have been based on the information supplied to Setala by the applicant. Setala has exercised all due care in reviewing the supplied information, but conclusions from the review are reliant on the accuracy and completeness of the supplied data. Setala does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them. Opinions presented in this report apply to the site conditions and features as they existed at the time of Setala's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this Report, about which Setala had no prior knowledge nor had the opportunity to evaluate.

EAP Affirmation

Section 16 (1) (b) (iv), Appendix 1 Section 3 (1) (r), Appendix 2 Sections 2 (i) and (j) and Appendix 3 Section 3 (s) of the Environmental Impact Assessment (EIA) Regulations, 2014 (promulgated in terms of the NEMA), require an undertaking under oath or affirmation by the EAP in relation to:

- The correctness of the information provided in the report;
- The inclusion of comments and inputs from stakeholders and interested and affected parties;
- The inclusion of inputs and recommendations from the specialist reports where relevant; and
- Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.

Setala Environmental and the EAPs managing this project hereby affirm that:

- To the best of our knowledge the information provided in the report is correct, and no attempt has been made to manipulate information to achieve a particular outcome. Some information, especially pertaining to the project description, was provided by the applicant and/or their subcontractors. In this respect, Setala's standard disclaimer (inserted in this report) pertaining to information provided by third parties applies.
- To the best of our knowledge all comments and inputs from stakeholders and interested and affected parties have been captured in the report and no attempt has been made to manipulate such comment or input to achieve a particular outcome. Written submissions are appended to the report while other comments are recorded within the report. For the sake of brevity, not all comments are recorded verbatim and are mostly captured as issues, and in instances where many stakeholders have similar issues, they are grouped together, with a clear listing of who raised which issue(s).
- Information and responses provided by the EAP to interested and affected parties are clearly presented in the report. Where responses are provided by the applicant (not the EAP), these are clearly indicated.

Profile and Expertise of EAPs

Setala Environmental (Pty) Ltd (Setala) has been appointed by the applicant as the independent consultants to undertake the Basic Assessment (BA) process required in terms of the National Environmental Management Act 107 of 1998 (NEMA).

Setala strives to provide sustainable solutions to a wide variety of clients. We have a comprehensive understanding of environmental best practice. We bring together a wealth of knowledge, experience and subject matter expertise. We apply the principles of Integrated Environmental Management. Setala Environmental is a wholly South African owned, independent environmental management services company providing environmental services in all Provinces in South Africa. The members of Setala Environmental have combined expertise and a proven track record of initiating and completing major projects. We have experience of more than 18 years in EIA applications.

As required by NEMA, the qualifications and experience of the key independent Environmental Assessment Practitioners (EAPs) undertaking the BA are detailed below and Curriculum Vitae provided in Appendix H.

Experience of the Environmental Assessment Practitioner: Mientjie Coetzee

- A registered professional Environmental Assessment Practitioner with EAPASA, with Registration number 2019/1774.
- Member of the International Association for Impact Assessment South Africa (IAIAsa). Membership Number: 3359.
- More than 19 years' experience in the Environmental Sector and has gained experience as Environmental Assessment Practitioner and Project Manager working on a wide range of projects including residential, mixed land-use, industrial, roads and filling stations.
- Primary skills include Environmental Screening Assessments, Environmental Impact Assessments (EIAs), Strategic Environmental Assessments (SEA), Public Participation and Environmental Management Programmes (EMPrs).
- Holder of multiple academic qualifications, the highest at NQF level 9 (masters degree).

Statement of Setala Environmental Independence

Neither Setala nor any of the authors of this Report have any material present or contingent interest in the outcome of this Report, nor do they have any pecuniary or other interest that could be reasonably regarded as being capable of affecting their independence or that of Setala.
Setala has no beneficial interest in the outcome of the assessment which is capable of affecting its independence.

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GLOSSARY OF TERMS

Activity (Development) – an action either planned or existing that may result in environmental impacts through pollution or resource use.

Alien vegetation - Alien vegetation is defined as undesirable plant growth (usually of foreign origin) which includes, but is not limited to all declared category 1 and 2 listed invader species as set out in the 1983 Conservation of Agricultural Resources Act (CARA) regulations. Other vegetation deemed to be alien are those plant species that show the potential to occupy in number any area within the defined construction area and which are declared undesirable.

Alternative – a possible course of action, in place of another, of achieving the same desired goal of the proposed project. Alternatives can refer to any of the following but are not limited to: site alternatives, site layout alternatives, design or technology alternatives, process alternatives or a no-go alternative. All reasonable alternatives must be rigorously explored and objectively evaluated.

Applicant – the project proponent or developer responsible for submitting an environmental application to the relevant environmental authority for environmental authorisation.

Biodiversity – the diversity of animals, plants and other organisms found within and between ecosystems, habitats, and the ecological complexes.

Construction – means the building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity but excludes any modification, alteration or expansion of such a facility, structure or infrastructure and excluding the reconstruction of the same facility in the same location, with the same capacity and footprint.

Cumulative Impacts – impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities to produce a greater impact or different impacts.

Direct impacts – impacts that are caused directly by the activity and generally occur at the same time and at the same place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally quantifiable.

Ecosystem – a dynamic system of plant, animal (including humans) and micro-organism communities and their non-living physical environment interacting as a functional unit. The basic structural unit of the biosphere, ecosystems are characterised by interdependent interaction between the component species and their physical surroundings. Each ecosystem occupies a space in which macro-scale conditions and interactions are relatively homogenous.

Emmissions - The release or discharge of a substance into the environment which generally refers to the release of gases or particulates into the air.

Environment – In terms of the National Environmental Management Act (NEMA) (Act No 107 of 1998) (as amended), "Environment" means the surroundings within which humans exist and that are made up of:
a) the land, water and atmosphere of the earth;
b) micro-organisms, plants and animal life;
c) any part or combination of (i) of (ii) and the interrelationships among and between them; and

d) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

Environmental Assessment (EA) – the generic term for all forms of environmental assessment for projects, plans, programmes or policies and includes methodologies or tools such as environmental impact assessments, strategic environmental assessments and risk assessments.

Environmental Authorisation – an authorisation issued by the competent authority in respect of a listed activity, or an activity which takes place within a sensitive environment.

Environmental Assessment Practitioner – the individual responsible for planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management programmes or any other appropriate environmental instrument introduced through the EIA Regulations.

Environmental Impact – a change to the environment (biophysical, social and/ or economic), whether adverse or beneficial, wholly or partially, resulting from an organisation's activities, products or services.

Environmental Impact Assessment (EIA) – the process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made.

Environmental Issue – a concern raised by a stakeholder, interested or affected parties about an existing or perceived environmental impact of an activity.

Environmental Management - ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

Environmental Management Programme - A detailed plan of action prepared to ensure that recommendations for enhancing or ensuring positive impacts and limiting or preventing negative environmental impacts are implemented during the life cycle of a project. The EMPr focuses on the construction phase, operation (maintenance) phase and decommissioning phase of the proposed project.

Expansion - means the modification, extension, alteration or upgrading of a facility, structure or infrastructure at which an activity takes place in such a manner that the capacity of the facility or the footprint of the activity is increased.

Fatal Flaw – issue or conflict (real or perceived) that could result in developments being rejected or stopped.

General Waste – household water, construction rubble, garden waste and certain dry industrial and commercial waste which does not pose an immediate threat to man or the environment.

Hazardous Waste – waste that may cause ill health or increase mortality in humans, flora and fauna.

Incident - An undesired event which may result in a significant environmental Impact but can be managed through internal response.

Indirect impacts – indirect or induced changes that may occur as a result of the activity. These types if impacts include all of the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.

Integrated Environmental Management – a philosophy that prescribes a code of practice for ensuring that environmental considerations are fully integrated into all stages of the development and decision-making process. The IEM philosophy (and principles) is interpreted as applying to the planning, assessment, implementation and management of any proposal (project, plan, programme or policy) or activity – at local, national and international level - that has a potentially significant effect on the environment. Implementation of this philosophy relies on the selection and application of appropriate tools for a particular proposal or activity. These may include environmental assessment tools (such as strategic environmental assessment and risk assessment), environmental management tools (such as monitoring, auditing and reporting) and decision-making tools (such as multi-criteria decision support systems or advisory councils).

Mitigate – the implementation of practical measures designed to avoid, reduce or remedy adverse impacts or enhance beneficial impacts of an action.

No-Go Option – in this instance the proposed activity would not take place, and the resulting environmental effects from taking no action are compared with the effects of permitting the proposed activity to go forward.

Open Space – environmentally sensitive areas which are not suitable for development and consist of watercourses, buffers, floodplains, steep slopes, sensitive biodiversity and/or areas of cultural or heritage significance.

Registered Interested and Affected Party – an interested and affected party whose name is recorded in the register opened for that application.

Rehabilitation – a measure aimed at reinstating an ecosystem to its original function and state (or as close as possible to its original function and state) following activities that have disrupted those functions.

Scoping – the process of determining the spatial and temporal boundaries (i.e. extent) and key issues to be addressed in an environmental assessment. The main purpose of scoping is to focus the environmental assessment on a manageable number of important questions. Scoping should also ensure that only significant issues and reasonable alternatives are examined.

Sensitive environment – any environment identified as being sensitive to the impacts of the development.

Significance – significance can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e. magnitude, intensity, duration and likelihood). Impact significance is the value placed on the change by different affected parties (i.e. level of significance and acceptability). It is an anthropocentric concept, which makes use of value judgements and science-based criteria (i.e. biophysical, social and economic).

Stakeholder engagement – the process of engagement between stakeholders (the proponent, authorities and I&APs) during the planning, assessment, implementation and/or management of proposals or activities.

Sustainable Development – development which meets the needs of current generations without hindering future generations from meeting their own needs.

Watercourse – means:
a) a river or spring;
b) a natural channel or depression in which water flows regularly or intermittently;
c) a wetland, lake or dam into which, or from which, water flows; and
d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse as defined in the National Water Act, 1998 (Act No. 36 of 1998) and a reference to a watercourse includes, where relevant, its bed and banks.

Wetland – means land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

ACRONYMS

CBA	Critical Biodiversity Areas
CBD	Central Business District
CMA	Catchment Management Agencies
CSIR	Council for Scientific and Industrial Research
DALRRD	Department of Agriculture, Land Reform and Rural Development
DESTEA	Department of Economic, Small Business Development, Tourism and Environmental Affairs
DMRE	Department of Mineral Resources and Energy
DSOE	Desired State of the Environment
DWS	Department of Water and Sanitation
ECF	Environmental Constraints Framework
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act, 1989 (Act No. 73 of 1989)
EIA	Environmental Impact Assessment
EIS	Ecological Importance & Sensitivity
EMC	Environmental Management Class
EMP	Environmental Management Plan
EWR	Ecological Water Requirements
GIS	Geographic Information System
HGM	Hydrogeomorphic
IBA	Important Bird Area(s)
IDP	Integrated Development Plan
I&AP	Interested and/or affected parties
MAP	Mean Annual Precipitation
MASL	Meters above sea level
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act
NFEPA	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act
NPAES	National Protected Areas Expansion Strategy
NWA	National Water Act

PAES	Protected Areas Expansion Strategy
PES	Present Ecological State
PDA	Primary Drainage Area
PPP	Public participation process
QDA	Quaternary Drainage Area
REC	Recommended Ecological Category (or Class)
REMC	Recommended Ecological Management Category (or Class)
RVI	Riparian Vegetation Index
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
SDI	Spatial Development Initiative
SEA	Strategic Environmental Assessment
SEMP	Strategic Environmental Management Plan
SWSA	Strategic Water areas of South Africa
WMA	Water Management Areas
WUL	Water Use License
WULA	Water Use License Application

destea
department of
economic, small business development,
tourism and environmental affairs
FREE STATE PROVINCE

(For official use only)

File Reference Number:	
Application Number:	
Date Received:	

Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2014, 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, 2014 as amended 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 **07 April 2017**. 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 in the electronic copy of the report submitted to the competent authority

SECTION A: ACTIVITY INFORMATION

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

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

a) Describe the project associated with the listed activities applied for

1 INTRODUCTION

Setala Environmental has been appointed as the independent environmental assessment practitioner (EAP) to apply for Environmental Authorisation (EA) for the construction of a PV solar farm at Woodland Hills Estate. The applicant is Woodland Hills Solar Farm (Pty) Ltd.

An application for authorisation of the project is submitted to the Department of Economic, Small Business Development, Tourism and Environmental Affairs, Free State Province (DESTEA) in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and the Environmental Impact Assessment (EIA) Regulations of 2014, as amended. The proposed project is a listed activity in terms of Sections 24(2) and 24(d) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) (as amended).

This Basic Assessment will provide information about the proposed PV solar farm at Woodland Hills Estate. The scope is restricted to this component of the project.

2 APPROACH TO THE BASIC ASSESSMENT PROCESS

The proposed project is a listed activity in terms of Sections 24(2) and 24(d) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) (as amended). The approach followed by the consultants is based on the specifications for the Basic Assessment Report in terms of the Environmental Impact Assessment Regulations, 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

The Department of Economic, Small Business Development, Tourism and Environmental Affairs, Free State Province (DESTEA), is the lead authority for this Environmental Impact Assessment (EIA) process and the development needs to be authorised by this Department in accordance with the National Environmental Management Act 107 of 1998 (NEMA) (Act 107 of 1998), and the 2014 NEMA Environmental Impact Assessment (EIA) Regulations, as amended.

To ensure that all requirements and processes in terms of the Acts are followed, the following tasks need to be conducted. The following has to be submitted to the DESTEA:

- Application form for Authorisation
- Draft Basic Assessment Report
- Environmental Management Programme (EMPr)
- Final Basic Assessment Report

The environmental authority will review the Application and final Basic Assessment Report and the following decisions may be made:

- Grant authorisation of the activity
- Refuse the activity

- Request further information or investigations
- Refer the application to a scoping process where substantial additional investigations or assessments are required to make a decision.

3 PROJECT LOCALITY

The proposed project is located on Woodland Hills Wildlife Estate in Bloemfontein. The project is proposed on Hillandale 2960 in the Mangaung Metropolitan Municipality in the Free State Province. The site is north of the N1 and west of the R700, on the northern outskirts of the city.

The project entails establishing and operating the proposed PV solar farm on a total footprint of 5.006 hectares.

The proposed project is set out in the Location Map below. (Refer to Appendix A for Site Location maps). *Refer to Figure 1 and Figure 2.*

- Study Site (Approximate Centre): 29° 2'36.48"S; 26°12'7.31"E.
- Quarter Degree Square (QDS): 2926AA.
- Quaternary Drainage Area (QDA): C52G.

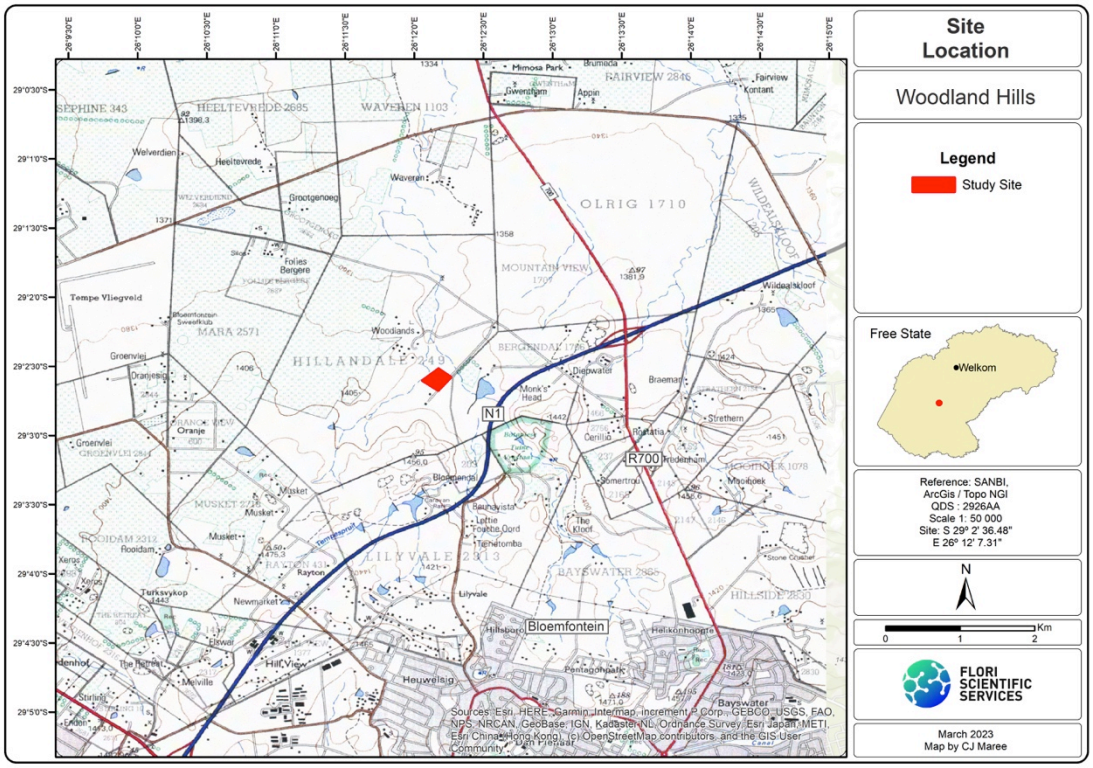


Figure 1: Study Site location

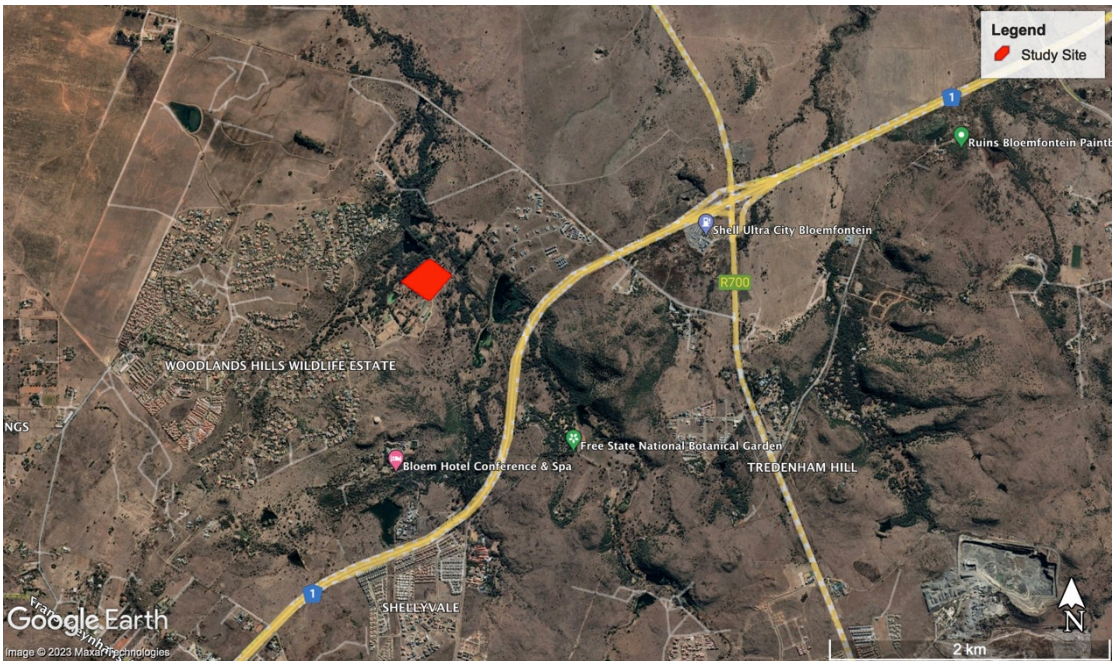


Figure 2: Study Site (Google Earth)

Figure 3: Study Site (Google Earth)

4 PROPERTY DESCRIPTION

The project is proposed on Hillandale 2960 in the Mangaung Metropolitan Municipality in the Free State Province.

Refer to below:

Item	Property	Ptn	SG code
1	Hillandale 2960		F00300000000296000000
2	Property coordinates		29° 2'36.48"S; 26°12'7.31"E

5 PROJECT DESCRIPTION

Background

Woodland Hills Wildlife Estate is a secure estate situated on the outskirts of Bloemfontein. This estate is renowned for its lifestyle close to nature. Amenities such as hiking and cycling trails, tennis courts, stables, an outdoor gym, play areas with jungle gyms, dams for catch-and-release fishing, game drives, and an outdoor entertainment area ensure that residents enjoy an active outdoor lifestyle. Accommodation includes full title residential properties that vary in size from compact 250-square-metre houses to luxury homes that could exceed 1,000 square meters, sectional title units of various sizes and styles. Residents of Woodland Hills share their home with game such as giraffe, zebra, springbok, waterbuck, nyala and more.

Woodland Hills is now looking to start the journey of providing its own power through a new green energy project. The proposed site for the solar plant is located inside the Woodland Hills Wildlife Estate, adjacent to Mangaung's Northern Wastewater Treatment Works.

Development Proposal

The Developer of Woodland Hills Estate wants to build a 2.7 megawatt-peak PV solar farm that will connect to the separate internal 11 kV networks of the Estate. It will comprise of two independent solar PV plants, one for Woodland Hills Phase 1 and one for Bergendal. The output of the Woodland Hills plant is 1.7 MVA and that of the Bergendal plant is 1 MVA. The Bergendal plant will be established in two stages. The black portion will be implemented initially, and the green portion will follow in future when the electricity demand allows. Refer to Figure 4, Site Plan and Figure 5, Layout Plan.

The two plants will be connected to the existing 11 kV underground cable reticulation systems of Hillandale and Bergendal respectively, using 11 kV underground cables that will run between above-ground miniature substations (minisub) and Ring Main Units (RMU).

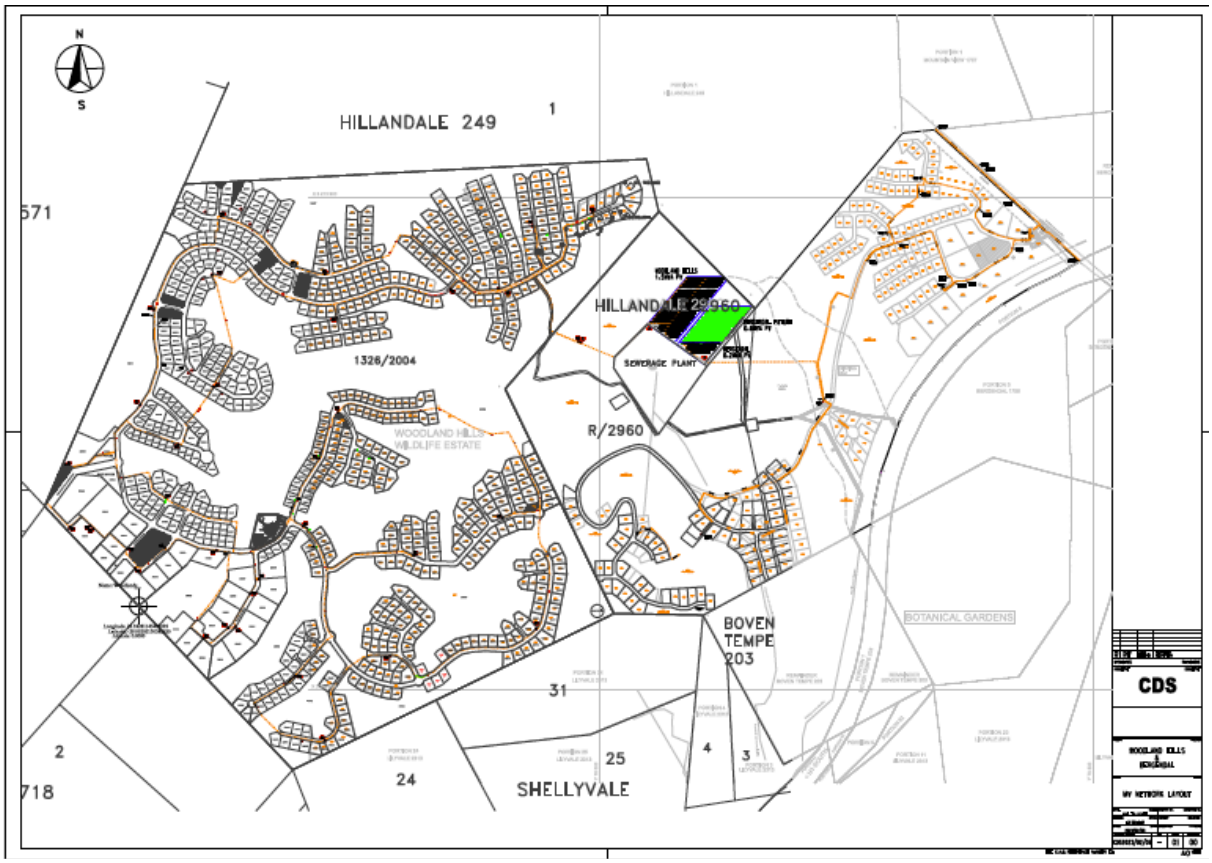


Figure 4: Site Plan

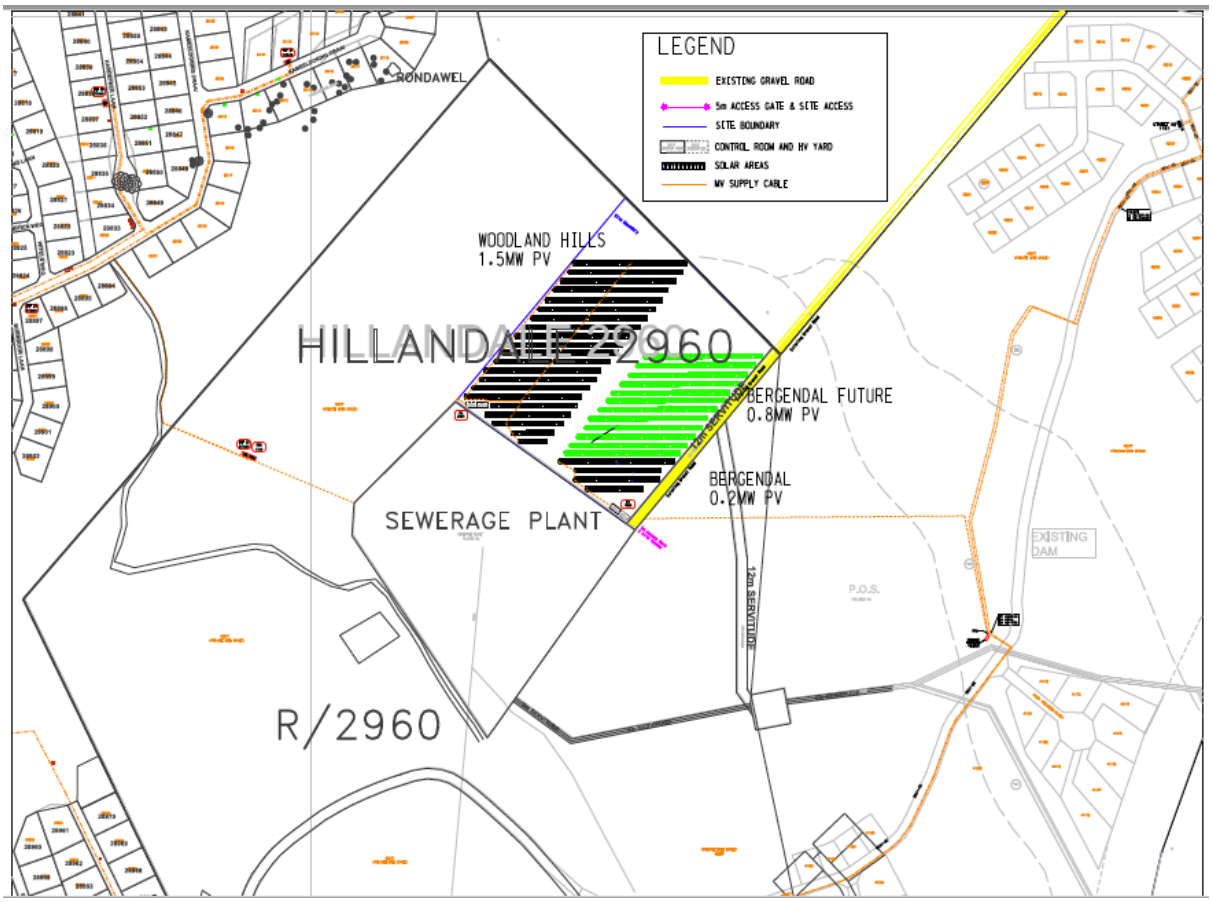
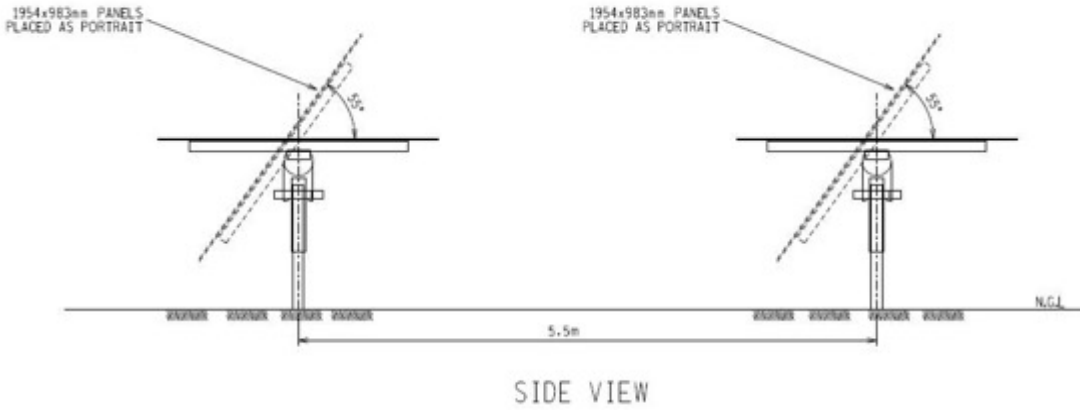


Figure 5: Layout Plan

Although both plants will eventually use single axis east-west sun tracking as per sketch 1, the Bergendal stage 1 installation could use fixed tables facing north as per sketch 2 or alternatively a sketch 1 installation with 50% of the tables facing east and 50% west until a tracker system is installed during stage 2.

Sketch 1: Single axis east-west sun tracking



Sketch 2: Fixed Tables facing North

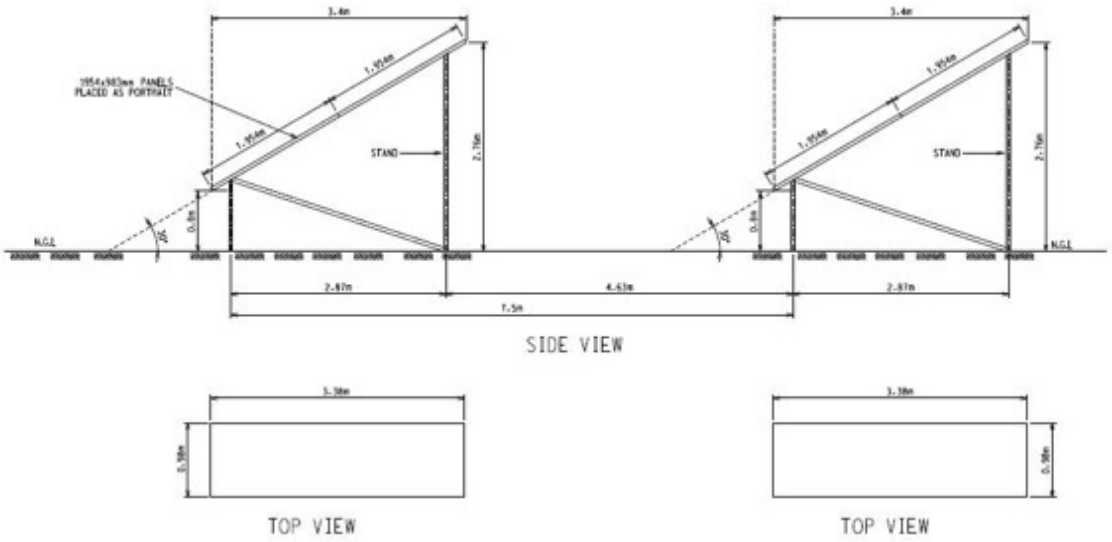



Figure 6: Visual of structures

When generation from the solar plant is not possible due to weather conditions or maintenance, the electrical supply will be obtained from the existing Woodland Hills and Bergendal primary substations.

The current Application for Environmental Authorisation is for the following:

- The development of facilities or infrastructure for the generation of electricity from a renewable resource where the output is 2.7 megawatts, and the total extent of the facility covers an area of ± 5 hectares;
- Construct a Ring Main Unit Board for each of the facilities to export the PV power.
- Construct a Control Room and HV Yard.
- Clear an area of approximately 5 hectares for the solar site.
- Clear more than 300 square metres of indigenous vegetation for the site.
- Develop access roads of 5 metres width within the solar plant.

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

6 LEGAL REQUIREMENTS

Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended.	Describe the portion of the proposed project to which the applicable listed activity relates.
GN R.327/2017 Activity 1	The development of facilities or infrastructure for the generation of electricity from a renewable resource 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; excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs— (a) within an urban area; or (b) on existing infrastructure.	Construct a 2.7 MW solar farm on ±5 hectares.
GN R. 327/2017 Activity 27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for—	Clearance of an area of ±5 hectares of indigenous vegetation for the solar farm.

	i) the undertaking of a linear activity; or ii) maintenance purposes undertaken in accordance with a maintenance management plan.	
Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 3 of the EIA Regulations, 2014 as amended.	Describe the portion of the proposed project to which the applicable listed activity relates.
GN R. 324/2017 Listing Notice 3 Activity 4	The development of a road wider than 4 meters with a reserve less than 13,5 meters. <u>Free State</u> i. Outside urban areas: (aa) A protected area identified in terms of NEMPAA, excluding disturbed areas; (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an international convention; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ff) Core areas in biosphere reserves; or (gg) Areas within 10 kilometers from national parks or world heritage sites or 5 kilometers from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas; or ii. Inside urban areas: (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; or (cc) Areas within urban protected areas.	Develop an access road of 5 metres to construct the facility within a protected area (nature reserve), which is the Woodlands Golf and Wildlife Estate.
GN R. 324/2017 Activity 12	The clearance of an area of 300 square meters or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. <u>Free State</u> i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; ii. Within critical biodiversity areas identified in bioregional plans; iii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning; or iv. Areas within a watercourse or wetland; or within 100 meters from the edge of a watercourse or wetland.	Clear more than 300 square metres of indigenous vegetation to construct a solar facility within a protected area (nature reserve), which is the Woodlands Golf and Wildlife Estate.
Activity No(s):	Provide the relevant Scoping and EIR Activity(ies) as set out in Listing Notice 2 of the EIA Regulations, 2014 as amended.	Describe the portion of the proposed project to which the applicable listed activity relates.
N/A	N/A	N/A

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.

a) SITE ALTERNATIVES

Alternative 1 (preferred alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
The proposed site for the Woodland Hills Solar Farm was selected based on the following parameters: • Accessibility to the existing 11kV underground cable reticulation systems of Hillandale and Bergendal using 11 kV underground cables that will run between above-ground miniature substations and Ring Main Units. • Access via and existing gravel road. • The locality within a public open space area away from residential units within the Woodland Hills Wildlife Estate. • The locality directly adjacent to Mangaung's Northern Wastewater Treatment Works The locality directly adjacent to Mangaung's Northern Wastewater Treatment Works which already impacted the Sense of Place in that specific area. • The site is not within a threatened veldtype/ecosystem. Although the site is within an ESA the overall biodiversity sensitivity is found to be Medium. • The site is considered to be of low heritage significance.	29° 2'36.48"S	26°12'7.31"E
Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)

In the case of linear activities:

Alternative:	Latitude (S):	Longitude (E):
Alternative S1 (preferred) Starting point of the activity		

Middle/Additional point of the activity		
End point of the activity		
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.

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 of this form.

b) LAY-OUT ALTERNATIVES

Alternative 1 (preferred alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
The proposed layout for the Woodland Hills Solar Farm was selected based on the following parameters: • Spatial orientation requirements of PV panels and associated infrastructure; • Layout relative to other existing infrastructure, such as existing 11kV underground cable reticulation systems of Hillandale and Bergendal; • Solar resource profile; • Topographical constraints, including surface water; and • Environmental constraints (no buffer zones were required).	29° 2'36.48"S	26°12'7.31"E
Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)

c) TECHNOLOGY ALTERNATIVES

Alternative 1
A PV solar farm consisting of PV panels with a Battery Energy Storage System (BESS) was initially considered but due to the costs associated with a BESS this proposal was not deemed feasible from a financial point of view.
Alternative 2
A PV solar farm consisting of PV panels with diesel generators was also considered but was also not deemed feasible from a financial point of view.
Alternative 3 (preferred alternative)
A PV solar farm consisting of PV panels only was deemed feasible from a financial point of view and was regarded as the preferred technology alternative.

d) OTHER ALTERNATIVES (E.G. SCHEDULING, DEMAND, INPUT, SCALE AND DESIGN ALTERNATIVES)

Design Alternative

Alternative 1 (preferred alternative)		
Although both plants will eventually use single axis east-west sun tracking as per sketch 1, the Bergendal stage 1 installation could use fixed tables facing north as per sketch 2 or alternatively a sketch 1 installation with 50% of the tables facing east and 50% west until a tracker system is installed during stage 2.		
Alternative 2		
Alternative 3		

e) NO-GO ALTERNATIVE

The no-go Alternative is to not develop the site. Should the no-go Alternative be implemented, the area will remain undeveloped and unutilised, and the status quo will remain the same.

Should the no-go alternative be considered the positive impacts associated with the proposed green energy project i.e. providing its own power to the Woodland Hills Wildlife Estate will not realize. In addition, no local employment opportunities during the construction and operational phases of the development will be created and no additional income to the local economy will be generated in the short or long term.

The no-go alternative is thus not considered a favourable option in light of the benefits associated with the proposed Woodland Hills PV Solar Farm; however, it will be used as a baseline from which to determine the level and significance of potential impacts associated with the Woodland Hills PV Solar Farm.

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:	Size of the activity:
Alternative A1[1] (preferred activity alternative)	50 060 m^2
Alternative A2 (if any)	m^2
Alternative A3 (if any)	m^2

or, for linear activities:

Alternative:	Length of the activity:
Alternative A1 (preferred activity alternative)	m
Alternative A2 (if any)	m
Alternative A3 (if any)	m

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

Alternative:	Size of the site/servitude:
Alternative A1 (preferred activity alternative)	m^2
Alternative A2 (if any)	m^2
Alternative A3 (if any)	m^2

4 SITE ACCESS

Does ready access to the site exist?	YES	NO
If NO, what is the distance over which a new access road will be built		

Access to the site is obtained from an existing gravel road on the Woodland Hills Wildlife Estate. A 5m access road and gate will be constructed.

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 kilometers, 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:

[1] "Alternative A.." refer to activity, process, technology or other alternatives.

- 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 center 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.

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 meters 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.

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 DWS);
- 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.

8 SITE PHOTOGRAPHS

Color photographs from the center of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this report. It must be supplemented with additional photographs of relevant features on the site, if applicable.

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.

10 ACTIVITY MOTIVATION

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

Is the activity permitted in terms of the property's existing land use rights?	YES	NO X	Please explain
A rezoning application to be submitted to the Mangaung Metropolitan Municipality.			
Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)	YES X	NO	Please explain
One of the main objectives of the PSDF is to reduce unemployment from 38% to 20%. The proposed activity is in line with this objective by providing a few employment opportunities during the construction and operational phase.			
(b) Urban edge / Edge of Built environment for the area	YES X	NO	Please explain
The proposed activity falls outside the urban edge.			
(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?).	YES X	NO	Please explain
One of the objectives of the Mangaung Metropolitan Municipality IDP 2022/2027 is sustainable development goals, which includes the rapid expansion of the municipality's energy generation capacity. The proposed activity is in line with this objection.			
(d) Approved Structure Plan of the Municipality	YES X	NO	Please explain
One of the objectives of the Mangaung Metropolitan Municipality IDP 2022/2027 is sustainable development goals, which includes the rapid expansion of the municipality's energy generation capacity. The proposed activity is in line with this objection.			
(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?)	YES	NO	Please explain
No Environmental Management Frameworks are relevant to this application.			

(f) Any other Plans (e.g. Guide Plan)	YES X	NO	Please explain
According to the Free State Biodiversity Plan (2015) the study site is within an ecological support area. The overall sensitivity of the site was found to be 'Medium'.			
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)?	YES X	NO	Please explain
One of the objectives of the Mangaung Metropolitan Municipality IDP 2022/2027 is sustainable development goals, which includes the rapid expansion of the municipality's energy generation capacity. The proposed activity is in line with this objection.			
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.)	YES X	NO	Please explain
The proposed activity will contribute, amongst others, energy security for the Woodland Hills Wildlife Estate by means of providing its own power. Temporary and permanent employment opportunities will be created and the workforce will as far as possible be from the local communities.			
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.)	YES X	NO	Please explain
No confirmation needed from the municipality.			
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.)	YES	NO	Please explain
Not applicable to proposed activity.			
Is this project part of a national programme to address an issue of national concern or importance?	YES X	NO	Please explain
The project addresses an issue of national concern i.e. provision of renewable energy.			
Do location factors favor 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.)	YES X	NO	Please explain

The proposed solar farm is perfectly situated due to the following:

- Close proximity to the existing 11kV underground cable reticulation systems of Hillandale and Bergendal using 11 kV underground cables that will run between above-ground miniature substations and Ring Main Units.
- Easy access via and existing gravel road.
- The locality within a public open space area away from residential units within the Woodland Hills Wildlife Estate.
- The locality directly adjacent to Mangaung's Northern Wastewater Treatment Works which already impacts the Sense of Place of the area.
- There are no environmental sensitivities on the site that needs to be avoided. Although the site is within an ESA the overall biodiversity sensitivity is found to be Medium.
- The site is considered to be of low heritage significance.

Is the development the best practicable environmental option for this land/site?	YES X	NO	Please explain
The, 'environment' should be seen as the sum total of one's surroundings, which include the natural, social and economic environments. Taking all constraints into account, the development as proposed underlines the principles as advocated by the term 'triple bottom line' (people, planet, profit) and this development proposal is in support of the goals of economic, social, and ecological integration and sustainability.			
Will the benefits of the proposed land use/development outweigh the negative impacts of it?	YES X	NO	Please explain
Negative impacts associated with the proposed development could be mitigated to levels that will be acceptable within the receiving environment. The positive impact of creation of job opportunities, energy security and generation of renewable energy, outweighs the negative impact that this project could have.			
Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?	YES X	NO	Please explain
The proposed activity will set a precedent for similar activities in the area, which could result in a large number of renewable energy projects which would be beneficial to the environment.			
Will any person's rights be negatively affected by the proposed activity/ies?	YES	NO X	Please explain
Dust and noise will be created during the construction phase but mitigation measures are in place to minimise these temporary impacts. An ECO will be permanently on site to ensure that the mitigation is applied and to handle and act on complaints that may be received during this period.			
Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?	YES	NO X	Please explain
The proposed activity is not influenced by the urban edge.			
Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?	YES	NO X	Please explain
The proposed activity is only for the generation of renewable energy at Woodland Hills Wildlife Estate.			
What will the benefits be to society in general and to the local communities?			Please explain

The proposed development will contribute to, amongst others, energy security and generation of renewable energy, benefiting the entire South Africa. Temporary and permanent employment opportunities will be created and the workforce will as far as possible be sourced from the local communities. This will bring much needed relief to an area which experiences an unemployment rate of 27,7% for economically active and 37,2% of the 150 128 economically active youth.	
Any other need and desirability considerations related to the proposed activity?	Please explain
The need for this project relates directly to the need for renewable energy projects in South Africa.	
How does the project fit into the National Development Plan for 2030?	Please explain
The proposed activity will contribute to the generation of renewable energy and provision of employment opportunities and skills development.	
Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.	

Current procedures and/or organisational structures are not necessarily achieving integrated decision-making and/or co-operative governance and, as a result, there is a failure to properly achieve the objectives of IEM as set out in Section 23 of NEMA. EIA's however often focus on the immediate harm a project will cause rather than any benefits it might create in the long term to sustainable development.

The stated objectives of Section 23 are to ensure integrated decision-making and co-operative governance so that NEMA's principles and the general objectives for integrated environmental management of activities can be achieved. The goals are to

a) promote the integration of the principles of environmental management set out in section 2 into the making of all decisions which may have a significant effect on the environment;
b) identify, predict and evaluate the actual and potential impact on the environment, socio- economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximising benefits, and promoting compliance with the principles of environmental management set out in section 2;
c) ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them;
d) ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment;
e) ensure the consideration of environmental attributes in management and decision- making which may have a significant effect on the environment; and
f) identify and employ the modes of environmental management best suited to ensuring that a particular activity is pursued in accordance with the principles of environmental management set out in section 2.

For this project the following actions were taken to reach the general objectives of Integrated Environmental Management as set out in Section 23 of NEMA:

a) Applicable environmental, economic and social aspects have been assessed, thereby ensuring an integrated approach in order to balance the needs of all whom would be affected by this development.
b) Mitigation measures have been supplied in the EMPr in order to ensure that all identified impacts are mitigated to acceptable levels.
c) The EA application has to be evaluated and approved by DESTEA and no construction may commence prior to the issuing of the Environmental Authorisation.
d) The procedures which are followed during the public participation programme are based on the NEMA EIA Regulations 2014, as amended.
e) DESTEA will take all information as represented in this report into consideration and may request further information should they feel that further studies/information is required before an informed decision can be made.
f) The project team (inclusive of the specialists) is confident that the mitigation measures as supplied in the EMPr are reasonable and will be the best way to manage anticipated impacts.

Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.
Chapter 2 of NEMA provides a number of principles that decision-makers have to consider when making decisions that may affect the environment, therefore, when a Competent Authority considers granting or refusing environmental authorisation based on an Environmental Impact Assessment, these principles must be taken into account. The NEMA principles with which this application conforms are described as follows: 1. 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. 2. Development must be socially, environmentally and economically sustainable. 3. Sustainable development requires the consideration of all relevant factors. The social, economic and environmental impacts of activities, including disadvantages and benefits, were considered, assessed and evaluated, and informed decision-making by the authority is hereby made possible.

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:

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
The National Environmental Management Act (Act 107 of 1998)	Listed activities in terms of GN R.327/2017 and GN R. 324/2017 are triggered by the proposed project	DESTEA	1998
The National Environmental Management: Protected Areas Act 57 of 2003	The Study Site is within a protected area (nature reserve), which is the Woodland Hills Wildlife Estate.	DFFE	2003
The National Water Act (Act No 36 of 1998)	No Water Use License or General Authorisation is required.	DWS	1998
The National Management: Waste Act (Act No 59 of 2008)	It is not envisaged that a waste permit will be required for the proposed development as no listed activities in terms of waste management are expected to be triggered.	DFFE	2008
The National Heritage Resources Act (Act 25 of 1999)	The proposed project falls within the scope of Section 38 of the National Heritage	SAHRA Free State Provincial Heritage Resources	1999

	Resources Act and the applicable activities are: • Any development or other activity which will change the character of a site exceeding 5000m^2 in extent The authorisation process in terms of the NHRA forms part of the EIA process. A Heritage Impact Assessment was electronically submitted to the South Africa Heritage Resource Agency (SAHRA) via SAHRIS as well as to the Free State Provincial Heritage Resources Authority as part of the public participation programme. Comment received from these authorities will be included and addressed in the Final BAR	Authority	
The National Energy Act (Act No. 34 of 2008)	Considering that the proposed solar farm is proposed to make use of PV technology and the solar resource for generation of electricity, the proposed project is in line with the Act.	Department of Mineral Resources and Energy	2008
Civil Aviation Act (Act 13 of 2009)	An application for approval of obstacles was submitted to the South African Civil Aviation Authority.	South African Civil Aviation Authority.	2009

12 WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a) Solid waste management

Will the activity produce solid construction waste during the construction/ initiation phase?	YES X	NO
If YES, what estimated quantity will be produced per month?	To be confirmed	

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

All solid waste generated by the development will have to be disposed of at the local approved municipal landfill site. Provision should be made for waste reduction through recycling.

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

At the local approved municipal landfill site.

Will the activity produce solid waste during its operational phase?	YES X	NO
If YES, what estimated quantity will be produced per month?	To be confirmed	

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

At the local approved municipal landfill site.

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

South Park Landfill site

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?	YES	NOX

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?	YES	NO X

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?	YES	NO X
If YES, what estimated quantity will be produced per month?	m^3	
Will the activity produce any effluent that will be treated and/or disposed of on site?	YES	NO X

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?	YES	NO X

If YES, provide the particulars of the facility:

Facility name:	
Contact person:	
Postal address:	

Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

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

c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other that exhaust emissions and dust associated with construction phase activities?	YES	NO X
If YES, is it controlled by any legislation of any sphere of government?	YES	NO X

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:

No emissions are generated by PV solar panels.

d) Waste permit

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA?	YES	NO X

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?	YES	NO X
If YES, is it controlled by any legislation of any sphere of government?	YES	NO X

Describe the noise in terms of type and level:

No noise is generated by PV solar panels.

13 WATER USE

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

Municipal	Water board	Groundwater	River, stream, dam or lake	Other	The activity will not use water

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?	YES	NO X

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, which have been taken to ensure that the activity is energy efficient:

Although both plants will eventually use single axis east-west sun tracking as per sketch 1, the Bergendal stage 1 installation could use fixed tables facing north as per sketch 2 or alternatively a sketch 1 installation with 50% of the tables facing east and 50% west until a tracker system is installed during stage 2.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

1. 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): [ ]

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

3. Has a specialist been consulted to assist with the completion of this section? YES X | NO

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.

Property description/physical address:

Province	Free State Province
District Municipality	Mangaung Metropolitan Municipality
Local Municipality	Mangaung Metropolitan Municipality
Ward Number(s)	49400048
Farm name and number	Hillandale 2960
Portion number	
SG Code	F00300030004121900000

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.

Current land-use zoning as per local municipality IDP/records: Private Open Space

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 X | NO

1 GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

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

Alternative S2 (if any):

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

Alternative S3 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper

						than 1:5

2 LOCATION IN LANDSCAPE

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

2.1 Ridgeline		2.4 Closed valley		2.7 Undulating plain / low hills	X
2.2 Plateau		2.5 Open valley		2.8 Dune	
2.3 Side slope of hill/mountain		2.6 Plain		2.9 Seafront	
2.10 At sea					

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

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

4 GROUNDCOVER

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

Natural veld -	Natural veld with	Natural veld with	Veld dominated	Gardens

good condition[E]	scattered aliens[E]	heavy alien infestation[E]	by alien species[E]	
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.

5 SURFACE WATER

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

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

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

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:

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

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

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

The proposed Solar Farm could be visible from the N1 freeway.

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:

N/A

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:

N/A

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

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

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:	YES	NO X
	Uncertain	

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:

Will any building or structure older than 60 years be affected in any way?	YES	NO X
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	YES	NO X

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

Extract from Heritage Impact Assessment conducted by Beyond Heritage (refer to Appendix D1).

Heritage Resources

Heritage observations within the study were limited to a low density lithic scatter with diagnostic MSA pointed flakes with faceted platforms. Some miscellaneous pieces also occur that could date to the LSA. The recorded observations were numbered sequentially with the prefix WH for Woodland Hills. General site conditions and site distribution of the recorded observations are illustrated in Figure 7 and briefly described in Table A. Recorded features are illustrated in Figures 8 and 9.

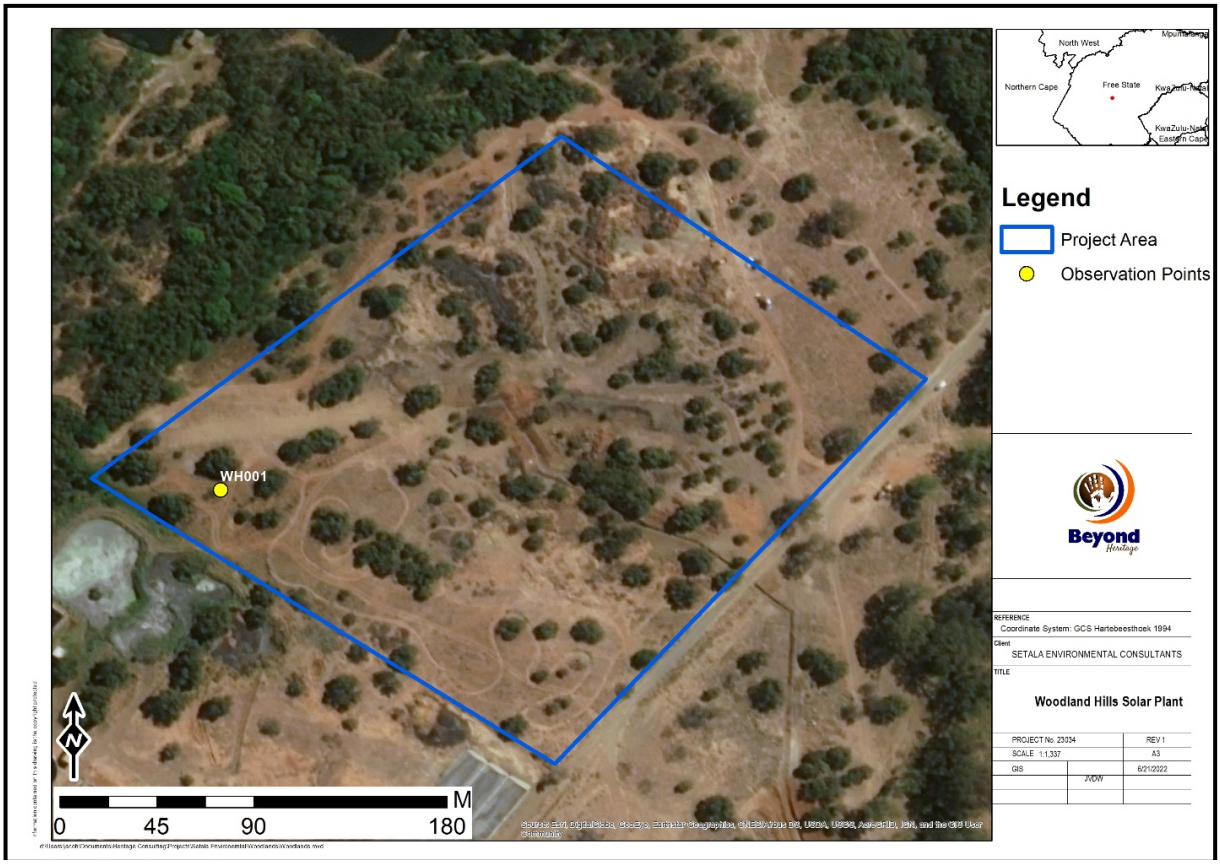


Figure 7: Site Distribution Map

Table A: Sites recorded in the study area.

Label	Description	Longitude	Latitude	Significance/ Field Rating
WH001	A low density scatter of less than 2 artefacts per square meter of mostly MSA lithics that are washing out of an erosion gully were recorded here. The artefacts are scattered near the western corner of the project area. Artefacts are mostly on igneous material and consist of diagnostic MSA blades and irregular cores. Some miscellaneous pieces also occur that could potentially date to the LSA based on the size of the artefacts but a larger sample is needed to confirm this.	26° 12' 5.3994"E	29° 2' 36.4488"S	Low Significance GP C

Figure 8: General site conditions at WH001

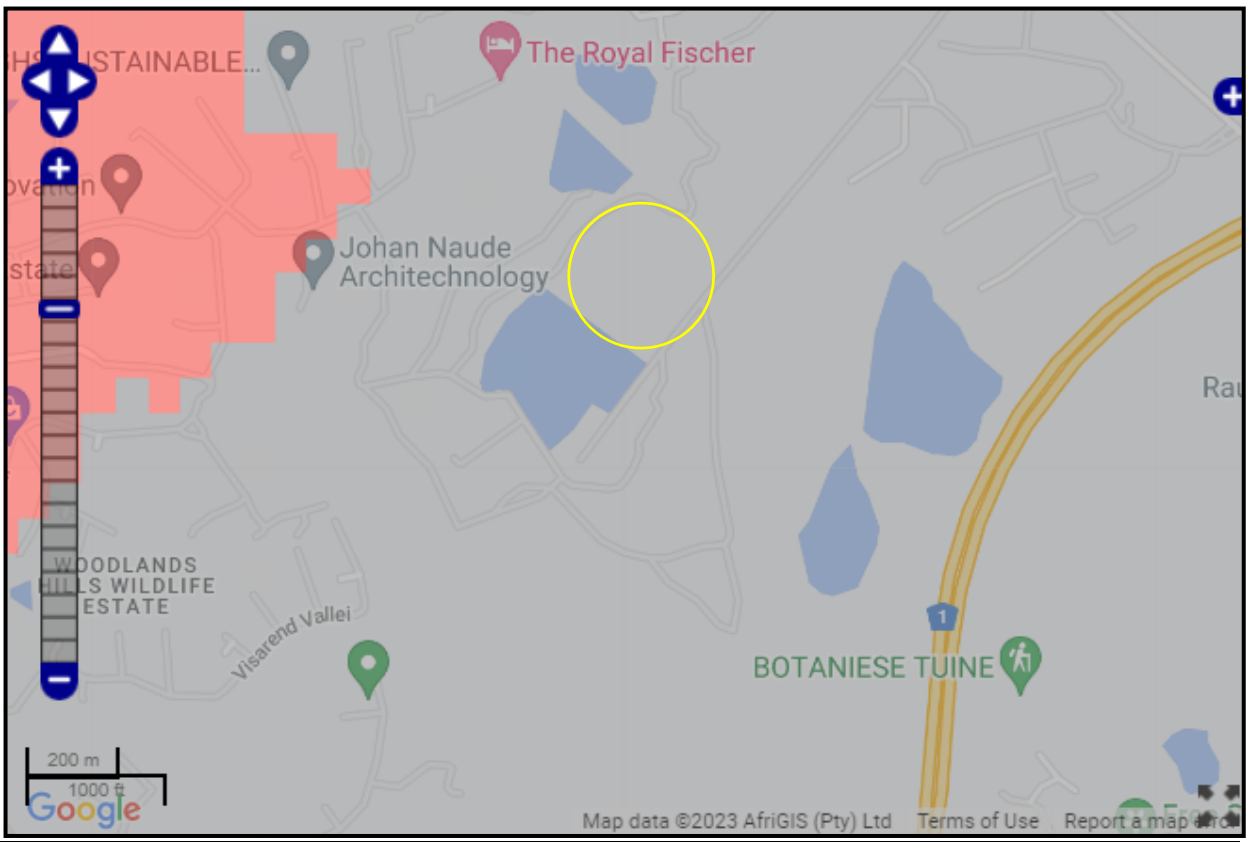
Figure 9: MSA artefact scatter at WH001

Cultural Landscape

The project area is generally flat with a small stream that runs along the north western edge. The project area itself is undeveloped but is situated within a developed estate. The cultural layering of the area dates from the Stone Age followed by the historical period and especially the Anglo-Boer War.

Paleontological Heritage

The study area is indicated as of insignificant/zero palaeontological significance on the SAHRA Paleontological map but is adjacent to an area of very high significance and an independent study was conducted for this aspect (Figure 10). Bamford (2023) found that based on the nature of the project, surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are the right age to contain fossils but not the right type as dolerite is predominant. Furthermore, the material to be excavated is soil and this does not preserve fossils. Since there is an extremely small chance that fossils from the nearby Adelaide Subgroup may be disturbed a Fossil Chance Find Protocol has been added to this report.



Color	Sensitivity	Required Action
RED	VERY HIGH	Field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	Desktop study is required
BLUE	LOW	No palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	No palaeontological studies are required
WHITE/CLEAR	UNKNOWN	These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map

Figure 10: Paleontological sensitivity of the approximate study area (yellow polygon) as indicated on the SAHRA Palaeontological sensitivity map.

Potential Impact

The main cause of impacts to archaeological resources is physical disturbance of the material itself and its context during removal of topsoil and vegetation as well as the excavations associated with the establishment of infrastructure. In terms of this project the main source of impacts will happen during the following activities.

- Establishment of new roads and upgrade of existing roads;
- Earthworks for temporary infrastructure including laydown areas;
- Excavation and levelling of the PV facility footprint;
- Trenches for cables and erection of powerlines;
- Influx of people into the area that could desecrate heritage resources sites;
- Excavations during construction of the sub stations.

Recorded isolated Stone Age scatters (WH001) are out of context and scattered too sparsely to be of significance apart from mentioning them in this report. Impact will be low as no sites of significance were identified during the survey. Any additional effects to subsurface heritage resources can be successfully mitigated by implementing a chance find procedure. Mitigation measures as recommended in this report should be implemented during all phases of the project. Impacts of the project on heritage resources is expected to be low during all phases of the development if mitigation measures are followed (Table B).

Pre-Construction phase

It is assumed that the pre-construction phase involves the removal of topsoil and vegetation as well as the establishment of infrastructure. These activities can have a negative and irreversible impact on heritage features if any occur. Impacts include destruction or partial destruction of non-renewable heritage resources.

Construction Phase

During this phase, the impacts and effects are similar in nature but more extensive than the pre-construction phase. Potential impacts include destruction or partial destruction of non-renewable heritage resources.

Operation Phase

No impacts are expected during the operation phase.

Impact Assessment for the Project

Table B: Impact assessment on MSA scatter at WH001

Nature: During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects.		
	Without mitigation	**With mitigation (Preservation/ excavation of site)**
Extent	Local (2)	Local (2)
Duration	Permanent (5)	Permanent (5)
Magnitude	Minor (2)	Minor (2)
Probability	Improbable (2)	Improbable (2)
Significance	**18 (Low)**	**18 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	NA	NA
Mitigation: • Implementation of a chance find procedure for the project;		
Cumulative impacts: The proposed project will have a low cumulative impact as no known heritage resources will be adversely affected.		
Residual Impacts: Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on, but this cannot be quantified.		

Conclusion and recommendations

The study area is generally flat and marked by dense vegetation with a small stream along the north western boundary of the Project Area. The study area is transformed through dumping of building rubble, excavations and small bike tracks that is clearly visible from aerial imagery and the project area is considered to be of low heritage significance. This was confirmed during the survey whereby finds were limited to a few isolated Middle Stone Age lithics attributed to background scatter of low significance.

Heritage observations within the study area were limited to a low density MSA scatter. The artefact scatter is of low significance as it does not represent a distinct archaeological site and impact will therefore be low. The feature requires no mitigation apart from mentioning it in this report.

The palaeontological sensitivity of the study area is insignificant/zero but close to very highly sensitive (red) rocks of the Adelaide Subgroup and an independent assessment was conducted for this aspect. Bamford (2023) concluded that it is extremely unlikely that any fossils would be preserved in the overlying soils and sands of the Quaternary or in the dolerite. There is a very small chance that fossils may occur in the adjacent shales of the late Permian Adelaide Subgroup (Normandien or Balfour Formations, Beaufort Group) so a Fossil Chance Find Protocol should be added to the EMPr

It is recommended that the project can commence on the condition that the following recommendations (Section 10) are implemented as part of the EMPr and based on approval from SAHRA.

Recommendations for condition of authorisation

The following recommendations for Environmental Authorisation apply and the project may only proceed based on approval from SAHRA:

Recommendations:
Avoidance of recorded heritage observations is the preferred course of action; if this is not possible the following apply:

- Regular monitoring of the development footprint by the ECO to implement the Chance Find Procedure for heritage and palaeontology resources in case heritage resources are uncovered during the course of construction.

Chance Find Procedures

Heritage Resources

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped, and a qualified archaeologist must be contacted for an assessment of the find and therefor chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below and monitoring guidelines

applicable to the Chance Find procedure is discussed below and monitoring guidelines for this procedure are provided.

This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

Monitoring Programme for Palaeontology – to commence once the excavations / drilling activities begin.

1. The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence.
2. When excavations begin the rocks and discard must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone or trace fossils) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
3. Photographs of similar fossils must be provided to the developer to assist in recognizing the trace fossils such as stromatolites in the dolomites or the Quaternary bones, rhizoliths, traces. This information will be built into the EMP's training and awareness plan and procedures.
4. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
5. If there is any possible fossil material found by the developer/environmental officer then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
6. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
7. If no good fossil material is recovered, then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.

8. If no fossils are found and the excavations have finished, then no further monitoring is required.

Reasoned Opinion

The overall impact of the project is considered to be low and residual impacts can be managed to an acceptable level through implementation of the recommendations made in this report. The socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures are implemented for the project.

Potential risk

Potential risks to the proposed project are the occurrence of intangible features, unrecorded cultural material and burial sites. This can cause delays during construction, as well as additional costs involved in mitigation, as well as possible layout changes.

Heritage Monitoring					
Aspect	Area	Responsible for monitoring and measuring	Frequency	Proactive or reactive measurement	Method
Cultural Resources Chance Finds	Entire project area	ECO	Weekly (Pre construction and construction phase)	Proactively	• If risks are manifested (accidental discovery of heritage resources) the chance find procedure should be implemented: 1. Cease all works immediately; 2. Report incident to the Sustainability Manager; 3. Contact an archaeologist/ palaeontologist to inspect the site; 4. Report incident to the competent authority; and 5. Employ reasonable mitigation measures in accordance with the requirements of the relevant authorities. Only recommence operations once impacts have been mitigated.

Management Measures for inclusion in the EMPr

Table C. Heritage Management Plan for EMPr implementation

Area	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Target	Performance indicators (Monitoring tool)
General Project area	Regular monitoring of	Construction	Throughout the project	Applicant EAP	Ensure compliance with	ECO Checklist/Report

	the development footprint by the ECO to implement the Chance Find Procedure for heritage and palaeontology resources in case heritage resources are uncovered during construction;				relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	

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.

According to Census 2011 the Mangaung Metropolitan Municipality has a population of 747 431, of which 83,3% are black African, 11,0% are white, 5,0% are coloured, with other population groups making up the remaining 0,7%. (statssa.gov.za).

Level of unemployment:

Of the 292 971 economically active (employed or unemployed but looking or work) people in Mangaung, 27,7% are unemployed. 37,2% of the 150 128 economically active youth (15 – 34 years) in the area are unemployed.

Economic profile of local municipality:

According to Census 2011, the average annual household income within the Mangaung Metropolitan Municipality is R29 400, about 50% of households live below this average.12% of the population indicated that they do not have any income.

In relation to household goods, 92% of households have access to a cell phone and 87% to a television. Only about 31% of households have access to a car. According to the 2018 General Household Survey 43.1% of the households and 28.5% of individuals receive some sought of social grant. This is third highest of all Metros following Buffalo City (30.6% individuals and 47.9 households) and Nelson Mandela Bay (28.6 individuals and 45.4 households).

Level of education:

Of those aged 20 years and older, 4,7% have completed primary education, 33,2% have some secondary education, 30,3% have completed matric and 14,2% have some form of higher education. 4,3% of this group have no formal schooling.

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R 30 000 000
What is the expected yearly income that will be generated by or as a result of the activity?	R 7 700 000
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	5
What is the expected value of the employment opportunities during the development and construction phase?	R 150 000
What percentage of this will accrue to previously disadvantaged individuals?	100%
How many permanent new employment opportunities will be created during the operational phase of the activity?	4
What is the expected current value of the employment opportunities during the first 10 years?	R 2 000 000
What percentage of this will accrue to previously disadvantaged individuals?	100 %

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. 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.

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)

Systematic Biodiversity Planning Category				If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
Critical Biodiversity Area (CBA)	Ecological Support Area (ESA)	Other Natural Area (ONA)	No Natural Area Remaining (NNR)	Ecological Support Area (ESA). ESA Ecological Support Areas (ESAs) are areas that are often seen as buffer areas for CBAs as well as corridors and connective areas between CBAs and/or other priority areas. ESAs are also often designated buffer and support areas along rivers and streams. The site investigations (ground-truthing) found the actual overall biodiversity to be 'Medium',

b) Indicate and describe the habitat condition on site

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).
Natural	%	
Near Natural (includes areas with low to moderate level of alien invasive plants)	50 %	The overall study site is characteristic of grassy shrubland. However, the main area identified / earmarked for the solar panels is moderately to badly degraded, and open veld. A number of common alien species are present on site, such as gum trees, blackwattle, blackjacks, etc. all species that quickly encroach on and colonise disturbed ground / areas. During field investigations no RDL or ODL plant species were observed in the study area. There are protected wild olive trees (*Olea europaea subsp. africana*) in the greater area, but none within the footprint of the project.
Degraded (includes areas heavily invaded by alien plants)	50 %	
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	%	

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

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 following information has been extracted from the Biodiversity Assessment (Terrestrial and Aquatic Ecological Assessments) conducted by Flori Scientific Services cc. Refer to Appendix D2.

Vegetation

The overall study site is characteristic of grassy shrubland. However, the main area identified / earmarked for the solar panels is moderately to badly degraded, and open veld. A number of common alien species are present on site, such as gum trees, blackwattle, blackjacks, etc. all species that quickly encroach on and colonise disturbed ground / areas.

During field investigations no RDL or ODL plant species were observed in the study area. There are protected wild olive trees (*Olea europaea subsp. africana*) in the greater area, but none within the footprint of the project.

Below is a summary of the vegetation of the study area.

Category Description	**Classification**
Biome	Grassland
Bioregion	Dry Highveld Grassland
Vegetation Types	Winburg Grassy Shrubland
Status	Not threatened (Least concern)

Fauna

The Woodland Hills Wildlife Estate was originally conceptualised as a golf estate but developed as a wildlife estate where more than 23 game species and abundant birdlife are found. Game such as kudu, giraffe, zebra, sable, roan antelope, nyala, waterbuck, impala, gemsbok, springbok, duiker, steenbok, and reedbuck are present on the Estate (www.woodlandhillsestate.co.za).

Mammals

A few large mammal species such as kudu, giraffe, zebra, sable, roan antelope, nyala, waterbuck, impala, gemsbok, and springbok were observed on the larger property of the Wildlife Estate. These species have been introduced onto the reserve over the years. The establishment of the solar facility will have no negative impact on these species as they are fenced in and well managed on the Estate. Besides these species and a few others on the estate (i.e. duiker and steenbok) no other large or medium sized mammal species are expected to occur regularly on the study site or wildlife area.

Other common smaller mammals do occur on the reserve such as mongoose, scrub-hare, and various rodent species and these will traverse the study site from time to time.

No RDL faunal species are expected to occur on the study site.

The spotted-necked otter (*Hydrictis maculicollis*), which is a threatened mammalian species with a status of 'Vulnerable', is flagged in the national screening tool as potentially occurring in the general area in which the study site is found. The otter will however, not occur in the study area itself, and is unlikely to occur on the wildlife estate due to lack of ideal habitat of larger rivers or streams.

Avifuana

The study area is not situated within any Important Bird Area (IBA). The closest IBA is the Soetdoring Nature Reserve, which is approximately 23,5 km northwest of the study site.

The advantage of the Solar PV site over a wind farm is that the former has very little negative impact on birds and bats.

Watercourses

There are no rivers or streams in the study area. The closest river is the Stinkhoutspruit (Stream), which is situated between 120 m and 150 m east and northeast of the boundary of the study site. The stream flows in a northerly direction. The stream has in-stream dams along its course and within

the Woodlands Wildlife Estate. There is also a small seasonal drainage line that flows north of the study site and eventually into the Stinkhoutspruit. There are in-stream, manmade dams in the area of the confluence of the two watercourses (Visarend and Rietduiker Dams that are situated on the larger wildlife estate). The small drainage line is also fed by water from a nearby WWTW.
According to the latest national wetland map there are no wetlands in the study area or immediate surrounding area. According to some maps (eg. Garmin Base Maps) there is/was a small seep wetland to the immediate west of the study site. However, this is where the WWTW is situated, along with its' maturation ponds (dams), buildings and other infrastructure. There are no wetlands on the study site.

Drainage Regions

Below is a summary of the drainage region / catchment area for the study site.

Level	Category
Primary Drainage Area (PDA)	C
Quaternary Drainage Area (QDA)	C52G
Water Management Area (WMA) – Previous / Old	Upper Orange
Water Management Area (WMA) – New (as of Sept. 2016)	Vaal (WMA 5)
Sub-Water Management Area	Riet – Modder
Catchment Management Agency (CMA)	Vaal (CMA 5)
Wetland Vegetation Ecoregion (WetVeg)	Dry Highveld Grassland (Group 3)
RAMSAR Site	No
Flagship Rivers	No
River FEPA (Freshwater Ecosystem Priority Area)	No
Wetland FEPA	No
Fish FEPA	No
Fish FSA (Fish Support Area)	No
Fish Corridor	No
Fish Migratory	No
National Strategic Water Source Area (SWSA)	No

Priority areas

The Study Site is within a protected area (nature reserve), which is the Woodlands Golf and Wildlife Estate. The Estate was officially registered as a protected area on the Protected Areas Register on 5 December 2000 (www.dffeportal.environment.gov.za).

Critical Biodiversity Area & Ecological Support Areas

According to the Free State Biodiversity Plan (2015) the study site is within an ecological support area (ESA 2)

Fatal flaws

There are no fatal flaws and the project may proceed.

Buffer Zones

No buffer zones or no-go zones are required.

Conclusions

The conclusions of the biodiversity study are as follows:

- The study site is situated within Winburg Grassy Shrubland. The veldtype is not a threatened ecosystem and as a status of 'Least Concern'.
- The study site is within a demarcated ecological support area (ESA), but is not within any demarcated CBA.
- The site is within a protected area (Woodland Hills Golf and Wildlife Estate), but not within any other priority areas.
- There are no watercourses on the study site, including wetlands.
- Taking all findings and recommendations into account it is the reasonable opinion of the author / specialist that the activity may be authorised. The project and related activities should be allowed to proceed.

Recommendations

The recommendations of the study are as follows:

- All recommended mitigating measures as proposed in this study and report should be implemented if the findings of this report are to remain pertinent. All of the recommended mitigating measures must form part of the conditions of the EA and EMPr.
- Some of the recommended mitigating measures are as follows:

1. The overall impacts on the existing natural environment related to the project are 'MODERATE'. The footprint of the project area is small and mostly within degraded veld, even though it is within a larger Wildlife Estate. No highly sensitive habitats are present in the footprint and no RDL fauna and flora. The main negative impact is the removal / clearing of vegetation for the establishment of the solar panels, under and around which the vegetation must be constantly kept short.
2. Any temporary storage, lay-down areas or accommodation facilities to be setup in existing disturbed areas (as far as possible) and within the study area.
3. Ensure a small footprint during construction phase.
4. No buffer zones or 'no-go' zones are required. However, no removed topsoil, rocks, vegetation, etc. may be dumped in open land outside of the study area. Removed topsoil and sand may be used to repair gravel roads, dongas, etc. on the Estate (Property).
5. Temporary site offices and lay-down areas must be setup within the study area and preferably no shrubland or trees (unless alien) to be cleared for a temporary site area.
7. No new access roads may be created to enter the site from the north or the east. This will create new watercourse crossings, which will damage watercourses (sensitive areas) and trigger the need for a water use license application (WULA) process.
6. All excess materials and equipment brought onto site must be removed after construction, unless properly stored in a fenced off storage area for future use or for use as spares.
7. All hazardous materials must be stored appropriately to prevent these contaminants from entering the water environment (in this case mostly groundwater).
8. All areas disturbed during the construction phase must be corrected and cleaned up, and ground / soils re-contoured to blend in with the original contours and lines of undisturbed and undeveloped adjacent areas.
9. A basic, standard rehabilitation plan for the project is required.
10. A basic, standard weed control programme is required. This programme / plan may form part of the routine maintenance plan for the entire site / project during the operational phase, such as cutting of grass and vegetation under the panels and along the pathways / corridors between the rows of panels, etc.
11. Site specific stormwater management plan is required, which should form part of the initial engineering / layout plans of the project. As part of the plan all attempts must be made to keep the flow / movement of surface stormwater as free and natural as possible. The erosion potential for the site is relatively low, although there are some steeper areas.

Figure 11: Sensitivity Map

10 DFFE SCREENING TOLL – DETERMINING SPECIALIST INPUT

DFFE SCREENING TOOL – DETERMINING SPECIALIST INPUT

The DFFE Screening Tool Report, dated 18 January 2023, is attached under Addendum J.

Environmental Sensitivities

The Screening Tool Report identified certain Environmental Sensitivities within the proposed development area and, based on these results recommend specialist studies that need to be undertaken.

These identified sensitivities are indicative only and must be verified on site by a suitably qualified person (the EAP or a specialist) before the need of the recommended specialist assessments can be confirmed.

The following table is applicable to the Woodland Hills PV facility:

Theme	Very High Sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme			X	
Animal Species Theme			X	
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme	X			
Avian Theme				X

Civil Aviation (Solar PV) Theme			X	
Defence Theme			X	
Landscape (Solar) Theme	X			
Paleontology Theme			X	
Plant Species Theme				X
RFI Theme		X		
Terrestrial Biodiversity Theme	X			

Specialist assessments identified:

Based on the selected classification and the environmental sensitivities of the proposed development footprint, a list of specialist assessments has been identified by the Screening Tool for inclusion in the assessment report. It is the responsibility of the EAP to confirm this list and to motivate the reason for not including any of the identified specialist studies where applicable including the provision of photographic evidence of the site situation.

Specialist Assessment	Motivation
Agricultural Impact Assessment	The site is situated within the Woodland Hills Wildlife Estate, which falls within the Woodlands Golf and Wildlife Estate, which was officially registered as a protected area on the Protected Areas Register on 5 December 2000. The site has not been used for any agricultural activities in the past. An Agricultural Impact Assessment study was therefore not included.
Landscape/Visual Assessment	A Visual Impact Assessment was done by EAP. *Refer to Visual Impact Assessment below.*
Archaeological and Cultural Heritage Impact assessment	An Archaeological Impact Assessment was done and is summarised in Chapter 7 and included under Appendix D1 of this Report.
Palaeontology Impact Assessment	An Archaeological Impact Assessment, including Palaeontology, was done and is summarised in Section B, 7 and included under Appendix D1 of this Report.
Terrestrial Biodiversity Impact Assessment	A Biodiversity Assessment was done and is summarised in Section B, 9 and included under Appendix D2 of this Report.
Aquatic Biodiversity Impact assessment	A Biodiversity Assessment was done and is summarised in Section B, 9 and included under Appendix D2 of this Report.
Civil Aviation assessment	An application for approvals of obstacles was submitted to the South African Civil Aviation Authority.
Defense Assessment	The SA Defence Force was contacted for comment and further actions will be based on their comment.
RFI Assessment	The Radio Frequency Interferance (RFI) that a new PV facility will have on existing electrical equipment must be evaluated. RFI from a PV facility is generally emitted from the inverters, as solar panels do not emit any radio frequency (RF). Since the proposed Solar facility will not include any inverters a RFI assessment was not included.
Geotechnical Assessment	The applicant will undertake site-specific geotechnical investigations during the design phase of the project, in other words after the EA has been issued. The final design of the foundations is done by engineers strictly according to generally acceptable engineering standards and norms, taking the site-specific geotechnical constraints and recommendations into

	account. The EAP can therefore with confidence state that a geotechnical study during the EIA stages of the project will not impact on the viability of the project and is therefore not required as part of the studies for Environmental Authorisation.
Socio-Economical Assessment	Due to the extent of the proposed Solar facility i.e. provision of power to the Woodland Hills Wildlife Estate by means of connection to the existing kV networks of the Estate, a Social Impact Assessment was not included. The Social Impact of the proposed solar facility is included in the Impact Assessment (refer to Section D: Impact Assessment).
Plant Species Assessment	A Biodiversity Assessment was done and is summarised in Section B, 9 and included under Appendix D2 of this Report
Animal Species Assessment	A Biodiversity Assessment was done and is summarised in Section B,9 and included under Appendix D2 of this Report.

11 VISUAL IMPACT ASSESSMENT

The proposed Woodland Hills solar facility is located within the Woodland Hills Wildlife Estate. The site is situated within a Public Open Space area directly adjacent to the Mangaung Northern Wastewater Treatment Works, approximately 350m from the residential units to the northeast and approximately 380m from residential units to the west. The N1 freeway is approximately 700m to the east.

The site is located in an area with relatively low significance in elevation, meaning that the site is not located on a mountain, at the foot of a mountain area or in an area with a significant difference in elevation. The site is located at an above mean sea level (amsl) of approximately 1375m at the highest elevation and at amsl of 1365m at the lowest elevation. The landform and drainage described above is unlikely to limit visibility and the viewshed extends over a wide area.

The main visual receptors in the area include the Woodlands Hill Wildlife Estate, Woodlands Golf and Wildlife Estate Nature Reserve and the N1 freeway.

Visually, the regional landscape has a medium absorption capacity: there are some visually intrusive artificial features present in the general locality which will serve to detract and diminish the visual impact presented by the new PV installations. These include the residential units of Woodlands Hill Wildlife Estate, Mangaung Northern Wastewater Treatment Works and the N1 freeway.

<u>Impacts Identified</u>

Construction Phase

- Partial loss of rural sense of place within Woodlands Hill Wildlife Estate.
- Windblown dust generated from vegetation removal, as well as dust from moving vehicles.
- Potential soil erosion from temporary access roads and laydown areas.
- Windblown litter from the laydown and construction sites.

Operational Phase

- Given the long term operation of the PV facility, the PV panels will become a fixture in the landscape, changing the local sense of place within the Woodland Hills Wildlife Estate.

These impacts and proposed mitigation measures are discussed in detail in Section D: Impact Assessment, of this report.

SECTION C: PUBLIC PARTICIPATION

1 ADVERTISEMENT AND NOTICE

Publication name	Beeld
Date published	27/02/2023
Site notice date placed	27/02/2023

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 41(2)(e) and 41(6) of GN 326

Key stakeholders (other than organs of state) identified in terms of Regulation 41(2)(b) of GN 326

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)
Lumari	Home Owners Association, Woodland Hills Wildlife Estate	admin@woodlandhills.co.za
Stephen le Roux	Red Rock Estate	stephen@redrockestate.co.za
Reuben Saaiman	Buffalo Ranch	suzette@buffaloranch.co.za
Solomzi Henge	Mangaung MM Northern Waste Water Treatment Works	Solomzi.henge@mangaung.co.za

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
Reuben Jan Saayman, Buffalo Ranch	Will respond when more information is provided
Eskom Distribution	Eskom Distribution (Dx) will raise no objection to the proposed works, however Eskom's conditions should be adhered to at all times and Eskom's power lines should be treated as live at all times.

4 COMMENTS AND RESPONSE REPORT

The practitioner must record all comments received from I&APs and respond to each comment before the Draft 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	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
DESTEA	Mrs. Grace Mkhosana	051 400 4843 051 400 4842		Mkhosana@destea.fs.gov.za	Private Bag X20801 Bloemfontein
Mangaung Metropolitan Municipality	Mr. Jaco Lamprecht	051 4005 331		jaco.lamprecht@mangaung.co.za	PO Box 3704, Bloemfontein, 9300
Department of Water and Sanitation Bloemfontein Regional Office Vaal WMA5 QDA C52G	Ms. Z Mathiso			MathisoZ@dws.gov.za	
Eskom Distribution Free State Operating Unit	Rene de Bruin			dBruinER@eskom.co.za	
Eskom Transmission	Lungile Motsisi	011 800 5732		motsisl@eskom.co.za	PO Box 1091, Cape Town
SKA Project Office		021 506 7300		enquiries@ska.ac.za	SARAO, 2 Fir Street, Black River Park, Observatory
SA Heritage Resources Agency	Mr Philip Hine	021 462 4502		phine@sahra.org.za	111 Harrington Street, Cape Town

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 must be 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 adheres to the minimum requirements in the EIA Regulations, 2014, as amended, and took applicable official guidelines into account. The issues raised by interested and affected parties were also addressed in the assessment of impacts, as well as the impacts of not implementing the activity.

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.

Existing (proposed) plans for the solar farm includes the following:

- The development of facilities or infrastructure for the generation of electricity from a renewable resource where the output is 2.7 megawatts, and the total extent of the facility covers an area of ± 5 hectares;
- Construct a Ring Main Unit Board for each of the facilities to export the PV power.
- Construct Control Room and HV Yard.
- Clear an area of approximately 5 hectares for the solar site.
- Clear more than 300 square metres of indigenous vegetation for the site.
- Develop access roads of 5 metres width within the solar plant.

Development of the Woodland Hills Solar Farm

The potential impacts of the proposed development were identified through a desktop study, a site visit, specialist studies and comments received during the public participation process. It is evident that the biggest impact of the project on the environment is expected to occur during the construction phase. It is expected that with the proposed mitigation of impacts and the implementation of the Environmental Management Programme, the expected negative impact could be mitigated to acceptable measures.

METHODOLOGY UTILISED IN THE RATING OF SIGNIFICANCE OF IMPACTS

The potential environmental impacts associated with the project will be evaluated according to its nature, extent, duration, intensity, probability and significance of the impacts, whereby:

- Nature: A brief written statement of the environmental aspect being impacted upon by a particular action or activity.
- Extent: The area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment phase of a project in terms of further defining the determined significance or intensity of an impact. For example, high at a local scale, but low at a regional scale.
- Duration: Indicates what the lifetime of the impact will be.

- Intensity: Describes whether an impact is destructive or benign.
- Probability: Describes the likelihood of an impact actually occurring; and
- Cumulative: In relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

TABLE 2: CRITERIA TO BE USED FOR RATING OF IMPACTS

Criteria	Description			
Extent	**National (4)** The whole of South Africa	**Regional (3)** Provincial and parts of neighbouring provinces	**Local (2)** Within a radius of 2 km of the construction site	**Site (1)** Within the construction site
Duration	**Permanent (4)** Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient	**Long-term (3)** The impact will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter. The only class of impact which will be non-transitory	**Medium-term (2)** The impact will last for the period of the construction phase, where after it will be entirely negated	**Short-term (1)** The impact will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase
Intensity	**Very High (4)** Natural, cultural and social functions and processes are altered to extent that they permanently cease	**High (3)** Natural, cultural and social functions and processes are altered to extent that they temporarily cease	**Moderate (2)** Affected environment is altered, but natural, cultural and social functions and processes continue albeit in a modified way	**Low (1)** Impact affects the environment in such a way that natural, cultural and social functions and processes are not affected
Probability of occurrence	**Definite (4)** Impact will certainly occur	**Highly Probable (3)** Most likely that the impact will occur	**Possible (2)** The impact may occur	**Improbable (1)** Likelihood of the impact materialising is very low

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

TABLE 3: CRITERIA FOR THE RATING OF CLASSIFIED IMPACTS

Low impact (4 - 6 points)	A low impact has no permanent impact of significance. Mitigation measures are feasible and are readily instituted as part of a standing design, construction or operating procedure.
Medium impact (7 - 9 points)	Mitigation is possible with additional design and construction inputs.
High impact (10 - 12 points)	The design of the site may be affected. Mitigation and possible remediation are needed during the construction and/or operational phases. The effects of the impact may affect the broader environment.
Very high impact (13 - 20 points)	Permanent and important impacts. The design of the site may be affected. Intensive remediation is needed during construction and/or operational phases. Any activity which results in a "very high impact" is likely to be a fatal flaw.
Status	Denotes the perceived effect of the impact on the affected area.
Positive (+)	Beneficial impact.
Negative (-)	Deleterious or adverse impact.
Neutral (/)	Impact is neither beneficial nor adverse.
It is important to note that the status of an impact is assigned based on the status quo – i.e. should the project not proceed. Therefore not all negative impacts are equally significant.	

1.1 PLANNING AND DESIGN PHASE

The potential impacts, significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the planning phase for the various alternatives of the proposed development.

ALTERNATIVE 1 (PROPOSAL)		
DIRECT IMPACTS		
Potential Impacts	Significance Rating	Mitigation Measures
Accessibility of the site The site has an existing entrance and additional impact on traffic is expected to be low.	LOW	• Site access to conform to municipal standards and road traffic legislation. • No new access roads may be created to enter the site from the north or the east. This will create new watercourse crossings, which will damage watercourses (sensitive areas) and trigger the need for a water use licence application (WULA) process.
Impact on the Natural Habitat and water resources The context of the development site within the macro area in terms of conservation areas also plays a major role when suitable areas for development are being considered. The development site (or parts thereof) could form part of important ecological corridors and such corridors could be destroyed if the functioning thereof is not being supported by the development proposal. The site is of medium sensitivity. The footprint of the project area is small and mostly within degraded veld, even though it is within a larger Wildlife Estate. No highly sensitive habitats are present in the footprint and no RDL fauna and flora. The main negative impact is the removal / clearing of vegetation for the establishment of the solar panels, under and around which the vegetation must be constantly kept	LOW	• Site-specific measures in terms of biodiversity as identified by Johannes Maree (Tel 082 564 1211), must be included in the contract with the Contractor and implemented by the Contractor during the construction phase. • Site specific stormwater management plan is required, which should form part of the initial engineering / layout plans of the project. As part of the plan all attempts must be made to keep the flow / movement of surface stormwater as free and natural as possible. The erosion potential for the site is relatively low, although there are some steeper areas.

short.		
INDIRECT IMPACTS		
No indirect impacts were identified during the planning and design phase.		
CUMULATIVE IMPACTS		
No cumulative impacts were identified during the planning and design phase.		

NO GO ALTERNATIVE		
DIRECT IMPACTS		
Potential Impacts	Significance Rating	Mitigation Measures
No direct impacts were identified during the planning and design phase.		
INDIRECT IMPACTS		
No indirect impacts were identified during the planning and design phase.		
CUMULATIVE IMPACTS		
No cumulative impacts were identified during the planning and design phase.		

1.2 CONSTRUCTION PHASE

ALTERNATIVE 1 (PROPOSAL)		
DIRECT IMPACTS		
Potential Impacts	Significance Rating	Mitigation Measures
Geology and soils Soil disturbances and erosion.	LOW	• A stormwater and erosion control plan must be implemented across the entire development site to prevent and control erosion impacts. • Careful monitoring during the construction phase is essential to locate and mitigate any erosion observed. Investigations must be conducted after every rain downpour. Any problems need to be rectified immediately to avoid the problem escalating. Special attention must be given to any slopes to the north and east that may lead to siltation of watercourses found in those directions. • All work areas must be monitored during the construction phase. • All areas disturbed during the construction phase must be corrected and cleaned up, and ground / soils re-contoured to blend in with the original contours and lines of undisturbed and undeveloped adjacent areas. • No removed topsoil, rocks, vegetation, etc. may be dumped in open land outside of the study area. Removed topsoil and sand may be used to repair gravel roads, dongas, etc. on the Estate (Property).

Groundwater and surface water contamination Contamination of the environment, specifically the soil and groundwater could arise during the construction phase. The potential exists for construction activities, workers and materials to transfer contaminants to the surrounding environment. This could arise as a result of, for example, inadequate ablution facilities, spillage of hazardous substances stored on the site, fuel and oil leaks, inappropriate responses to hazardous spills and improper waste handling, storage and disposal.	LOW	• Any portable toilets should be kept away from sensitive drainage areas. Portable toilets should be sealed units that can be cleaned by truck and the waste must be taken to a suitable sewage facility for treatment. They should be well maintained and regularly cleaned, and sewage should not be allowed to directly access the groundwater. • All vehicles shall be properly maintained and serviced so that no oil leaks occur on site. • A storm water plan must be available and used during all the phases of construction. • Vehicles and machines on site must be maintained properly to ensure that oil spillages are kept at a minimum. • Spill trays must be provided for refueling. • Every effort must be made to ensure that any chemicals or hazardous substances do not contaminate the soil or ground water on site. • All hazardous materials must be stored appropriately to prevent these contaminants from entering the water environment (in this case mostly groundwater).
Loss of natural vegetation This impact is associated with disturbance to and/or destruction of the flora component. During construction the activities could cause a negative impact where insensitive clearing for construction and access purposes, etc. is required. Insensitive clearing can cause the destruction of habitat. Not only does vegetation removal represent a loss of seed and organic matter, but it is also a loss of protection to plants and small animals. Insensitive vegetation clearance can also cause erosion. <u>The development site</u> The footprint of the project area is small and mostly within degraded veld, even though it is within a larger Wildlife Estate. No highly sensitive habitats are present in the footprint	MEDIUM	Detail mitigation measures are stipulated in the EMPr and include the following: • The loss of vegetation can be off set with the control and management of the large open areas on the rest of the site and property, including the control of alien invasive trees. • A basic weed control programme must be implemented as part of the project. This may form part of the routine maintenance programme for the overall project and site.

and no RDL flora. The loss of natural vegetation will be moderate to high on the localised footprint of the proposed development in the study area, but low on a regional scale.		
Loss or impact on wildlife (general) This impact is associated with loss or impact of the fauna component. During construction the activities could cause a negative impact where insensitive clearing for construction and access purposes, etc. is required. Insensitive clearing can cause the destruction of habitat. Not only does vegetation removal represent a loss of seed and organic matter, but it is also a loss of protection to plants and small animals. <u>The development site</u> The footprint of the project area is small and mostly within degraded veld, even though it is within a larger Wildlife Estate. No highly sensitive habitats are present in the footprint and no RDL fauna.	MEDIUM	• Care must be taken not to interact directly with any wild life encountered. • Any bird nests or active animal burrows encountered during construction phase must not be interfered with. If encountered must first be discussed with specialist as how best to proceed.
Impeding & Impounding watercourses There are no watercourses on the site such as rivers, streams, prominent drainage lines and wetlands. Therefore, no buffer zones to be implemented on the site itself. However, care must be made to avoid any activities outside of the study site. Especially to the north and east where there are drainage lines, streams (Stinkhoutspruit) and dams.	LOW	No construction activities may take place outside the study site.
Impacts associated with construction activities such as noise, dust and safety	LOW	<u>Noise mitigation measures</u> • Construction hours will be restricted to specific periods that exclude Sundays and public holidays.

The negative impact of noise and dust, generally associated with construction activities, are temporary, occurring mostly during the construction phase. The impact should however be considered in context with the nature of the surrounding area. <u>Minimal construction activities to take place.</u> The noise and dust impact are therefore not expected to be significant.		• Provide all equipment with standard silencers. Maintain silencer units in vehicles and equipment in good working order. • All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability. • Construction staff working in area where the 8-hour ambient noise levels exceed 60 dBA must have the appropriate Personal Protective Equipment (PPE). • All operations should meet the noise standard requirements of the Occupational Health and Safety Act (Act No. 85 of 1993). <u>Dust mitigation measures</u> • Sweeping of construction sites, clearing of building rubble and debris as well as regular watering of the construction site (storage areas, roads, etc.) must take place on a regular basis. • There should be strict speed limits on site roads to prevent the liberation of dust into the atmosphere. • Dust suppression must be used during dry periods during the construction phase, especially in close proximity to the homesteads, buildings, etc. <u>Safety mitigation measures</u> • A Fire Management Plan has to be identified during the pre-construction phase and must be implemented throughout the construction and operation phases of the development.
Traffic The construction phase is likely to generate additional traffic in terms of heavy vehicles and machinery along the access near to homesteads and the WWTW. This will however be of limited impact to traffic.	MEDIUM	• The limited additional traffic generated is likely to be well within the capacity of the existing road network. • Care must be taken with heavy machinery used on the project. All access roads used during construction must be monitored and maintained.
Impact of Labourers An uncontrolled influx of labourers with resulting increase in crime and squatting would place pressure on the natural environment. This could be severe, resulting in permanent damage to the environment if not	LOW	• Mitigation measures to counter impact on the natural environment and limit potential for crime during the construction phase should include specifications in terms of control of construction workers (i.e. provision of toilet and cooking facilities, provision of either accommodation facilities or transport facilities,

mitigated properly. Minimal construction activities will take place and only a few labourers are expected to work on the site.		implementation of Environmental Educational Programmes, etc.).
Impact on Cultural Heritage Resources During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects. Development Site Heritage observations within the study were limited to a low-density lithic scatter with diagnostic MSA pointed flakes with faceted platforms. Some miscellaneous pieces also occur that could date to the LSA.	LOW	• Regular monitoring of the development footprint by the ECO to implement the Chance Find Procedure for heritage and palaeontology resources in case heritage resources are uncovered during the course of construction.
Waste Management Due to the nature of the activity, waste is anticipated to be minimal.	LOW	• Develop a central waste temporary holding site to be used during construction. (if required). This site should comply with the following: • Skips for the containment and disposal of waste that could cause soil and water pollution, i.e. lubricants, etc.; • Small lightweight waste items should be contained in skips with lids to prevent wind littering; • Bunded areas for containment and holding of dry building waste; • Workers will only be allowed to use temporary chemical toilets on the site.
Visual Impact and Sense of Place The visual impacts associated with the proposed activity are the following: • partial loss of sense of place associated with Woodland Hills Wildlife Estate • windblown dust generated from vegetation removal as well as dust from moving vehicles	LOW	• The loss of vegetation can be off set with the control and management of the large open areas on the rest of the site and property, including the control of alien invasive trees. • Following the removal of the vegetation, windblown dust during construction should be monitored by the ECO to ensure that it does not become a nuisance factor to the local receptors. Should excessive dust be generated from the movement of vehicles

• Potential soil erosion from temporary access road and laydown areas • Lights at night for security		on the roads such that the dust becomes visible to the immediate surrounds, dust-retardant measures should be implemented under direction from the ECO. • Lighting needs to be restrained and should be limited to strategic nodes/ office areas. • Fencing should not have security lights at night. • No overhead lighting should be utilised.
Employment opportunities Positive economic impacts are anticipated. The impact on employment would be positive, and although the impact is expected to be small; any contribution to more employment is an achievement in South Africa. The proposed PV facility could create ±5 employment opportunities during the construction phase.	POSITIVE MEDIUM	
INDIRECT IMPACTS		
Economic impacts Positive economic impacts are anticipated. The impact on employment would be positive, and although the impact is expected to be small; any contribution to more employment is an achievement in South Africa.	POSITIVE LOW	Positive economic impacts are anticipated during the construction phase of the proposed development. The construction phase of the proposed development will provide employment opportunities. The construction phase employment opportunities generated by the proposed development are considered a positive economic impact of low significance.
CUMULATIVE IMPACTS		
Biodiversity impacts	MEDIUM	

NO GO ALTERNATIVE		
DIRECT IMPACTS		
Potential Impacts	Significance Rating	Mitigation Measures
All the impacts outlined above will not apply to the No-Go alternative as the status quo will apply and the environment will remain as it is currently. However, it is important to note that		

the benefits associated with the development will also not materialise, and it must be noted that the majority of the impacts identified for the development were mitigated to a negative low or positive impact once the measures for mitigation were applied, indicating that maintaining the status quo is to lose the opportunity of a beneficial development with negligible environmental impacts.		
INDIRECT IMPACTS		
No indirect impacts were identified during the construction phase.		
CUMULATIVE IMPACTS		
No cumulative impacts were identified during the construction phase.		

1.3 OPERATIONAL PHASE

ALTERNATIVE 1		
DIRECT IMPACTS		
Potential Impacts	Significance Rating	Mitigation Measures
Alien and invasive plant species The spread of alien weed species should be prevented.	LOW	A basic, standard weed control programme is required. This programme / plan may form part of the routine maintenance plan for the entire site / project during the operational phase, such as cutting of grass and vegetation under the panels and along the pathways / corridors between the rows of panels, etc.
Avifauna The attraction of some novel bird species due to the development of a solar farm with associated infrastructure such as lake effect, perches, nest and shade opportunities. Mortality of bird species due to collisions with solar panels.	LOW	Bird diverters, perch deterrents and the application of Non-polarising white tape can be used around and/or across panels to minimise reflection which can attract aquatic birds and insects (food) as panels mimic reflective surfaces of waterbodies.
Soil and groundwater pollution	LOW	The application of strict chemical control protocols as per the EMPr.

Chemicals being used to keep the PV panels clean from dust (suppressants) etc.		
Erosion Storm water management is essential and a full-time task, even during dry periods. Any lack of care may lead to the slow degrading of the site, rendering it susceptible to severe damage in the event of unexpected flooding, and subsequent potential damage to equipment on site due to gradual erosion due to normal rainfall events, or by unexpected huge damage due to random extreme flood events.	LOW	• A Stormwater Management Plan must be implemented. • Facilitate revegetation of denuded areas throughout the site.
Visual Impacts and associated impact on sense of place Given the long-time operational period of the PV facility, the PV panels will become a fixture in the landscape within the Woodland Hills Wildlife Estate.	LOW	• Continued erosion control and management of dust • Litter and waste should be effectively managed to avoid visual problems in the area. • Implementation of basic, standard weed control programme. This programme / plan may form part of the routine maintenance plan for the entire site / project during the operational phase, such as cutting of grass and vegetation under the panels and along the pathways / corridors between the rows of panels, etc.
Implementation of renewable energy facility South Africa has one of the most carbon-intensive economies in the world, thus making the greening of the electricity mix a national imperative. Generation of electricity by	POSITIVE HIGH	

means of a renewable resource provides an ideal means for reaching emission reduction targets in a relatively easy manner. In addition, and of specific relevance to South Africa, sun as energy source is not dependent on water (as compared to the massive water requirements of conventional power stations), poses limited pollution and health risks, specifically when compared to coal and nuclear energy plants. In a local context Woodland Hills Wildlife Estate is now looking to start the journey of providing its own power through a new green energy project.		
Socio-Economic Impact Employment opportunities Positive economic impacts are anticipated. The impact on employment would be positive, and although the impact is expected to be small; any contribution to more employment is an achievement in South Africa. The proposed PV facility could create ±4 permanent employment opportunities for over a 20+ year period. Additional temporary employment opportunities will also be created, linked to maintenance and cleaning of solar panels etc. Most of the employment opportunities associated with the operational phase is likely to benefit	MEDIUM POSITIVE	The proposed development will supply employment opportunities and will contribute to the local economy. The operational phase employment opportunities generated by the proposed development are considered a positive economic impact of low significance.

historically disadvantage members of the community. However, given that the solar energy sector in South Africa is relatively new, several of the skilled positions may need to be filled by people from other parts of South Africa. It will also be possible to increase the number of local employment opportunities through the implementation of a skills development and training programme linked to the operational phase.		
INDIRECT IMPACTS		
CUMULATIVE IMPACTS		
Renewable energy infrastructure and clean renewable energy • Overall reduction in CO_2 emission; and • Reduction in water consumption for energy generation.	HIGH Positive	
Creation of employment and business opportunities	MEDIUM Positive	

1.4 DECOMMISSIONING AND CLOSURE PHASE

In the case of the proposed PV facility a decommissioning phase is likely to involve the disassembly and replacement of the existing components with more modern technology. This is likely to take place in the 20 - 28 years post commissioning. The most likely negative impact that will be associated with the replacement of old with new technology is the waste generated by the removal of the old solar panels and its associated structures.

The final decommissioning phase will have similar impacts and mitigation than the construction phase as assessed in this report and it will be possible to mitigated impacts to acceptable levels.

The decommissioning phase is likely to create additional, construction type jobs, as opposed to the jobs losses typically associated with decommissioning. This will be a positive impact.

The decommissioning phase will be addressed in full at that time by hand of the thén relevant legislation.

2 NO GO ALTERNATIVE

NO GO ALTERNATIVE		
DIRECT IMPACTS		
Potential Impacts	Significance Rating	Mitigation Measures
All the impacts outlined above will not apply to the No-Go alternative as the status quo will apply and the environment will remain as it is currently. However, it is important to note that the benefits associated with the development will also not materialise, and it must be noted that the majority of the impacts identified for the development were mitigated to a negative low or positive impact once the measures for mitigation were applied, indicating that maintaining the status quo is to lose the opportunity of a beneficial development with negligible environmental impacts.		
INDIRECT IMPACTS		
No indirect impacts were identified during the operational phase.		
CUMULATIVE IMPACTS		
No cumulative impacts were identified during the operational phase.		

A complete impact assessment in terms of Regulation 19(3) of GN 326 must be included as Appendix F.

3 ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, an environmental impact statement will be completed. This will sum up the impact 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 and the significance of impact).

PLANNING & DESIGN PHASE (PROPOSAL)

Impact Description	Extent Local /Regional/ National	Duration Temporary / Permanent	Intensity Low/Moderate/ High/Very High	Probability of occurrence Improbable/ Possible/Highly Probable/Definite	Significance Rating (after mitigation)
Accessibility of the site	Local	Temporary	Low	Possible	Negative Low (-6)
Impact on Natural Habitat and water resources	Local	Temporary	Low	Possible	Negative Low (-6)

CONSTRUCTION PHASE (PROPOSAL)

Impact Description	Extent Local /Regional/ National	Duration Temporary / Permanent	Intensity Low/Moderate/ High/Very High	Probability of occurrence Improbable/ Possible/Highly Probable/Definite	Significance Rating (after mitigation)
Soil disturbances and erosion	Local	Temporary	Low	Possible	Negative Low (-6)
Groundwater and surface water contamination	Local	Temporary	Low	Possible	Negative Low (-6)
Loss of Natural vegetation	Local	Permanent	Moderate	Possible	Negative Medium (-9)
Loss or impact on wildlife (general)	Local	Permanent	Moderate	Possible	Negative Medium (-9)
Impeding & Impounding watercourses	Local	Temporary	Moderate	Improbable	Negative Low (-5)
Impact of Noise, Safety and Dust	Local	Temporary	Moderate	Improbable	Negative Low (-5)
Traffic Impact	Regional	Temporary	Moderate	Possible	Negative Medium (-9)
Impact of Labourers	Local	Temporary	Low	Improbable	Negative Low (-4)
Impact on Cultural Heritage Resources	Local	Permanent	Low	Improbable	Negative Low (-6)
Waste Management	Local	Temporary	Low	Possible	Negative Low (-6)
Visual Impact and Impact on Sense of Place	Local	Temporary	Low	Possible	Negative Low (-6)
Employment opportunities This will be a POSITIVE impact	Local	Temporary	Low	Definite	Positive Medium (+8)

OPERATIONAL PHASE

Impact Description	Extent Local /Regional/ National	Duration Temporary / Permanent	Intensity Low/Moderate/High/ Very High	Probability of occurrence Improbable/ Possible/Highly Probable/Definite	Significance Rating (after mitigation)
Soil and groundwater contamination	Local	Permanent	Low	Improbable	Negative Low (-6)
Erosion impacts	Local	Permanent	Low	Improbable	Negative Low (-6)
Alien and invasive plant species	Local	Permanent	Low	Improbable	Negative Low (-6)
Impacts on Avifauna	Local	Permanent	Low	Improbable	Negative Low (-6)
Visual impacts and associated impact on Sense of Place	Local	Permanent	Low	Improbable	Negative Low (-6)
Implementation of renewable energy facility	Local	Permanent	Moderate	Definite	Positive High (+10)
Socio-Economic Impacts Employment opportunities This will be a POSITIVE impact	Local	Permanent	Moderate	Definite	Positive High (+11)

4 IMPACT SUMMARY OF THE PROPOSAL OR PREFERRED ALTERNATIVE

For proposal:

The impact rating of the identified environmental aspects revealed that the majority of the negative environmental impacts will be experienced during the construction phase. The majority of these impacts will have a LOW significance. It is envisaged that these impacts can be easily mitigated and satisfactorily managed. The management of the impacts identified in the BAR for the construction and operational phases, are outlined in the specialist report recommendations and in the EMPr.

Summary and reasons for selecting the proposal or preferred alternative:

The Developer of Woodland Hills Estate wants to build a 2.7 megawatt-peak PV solar farm that will connect to the separate internal 11 kV networks of the Estate. It will comprise of two independent PV solar plants, one for Woodland Hills Phase 1 and one for Bergendal. The output of the Woodland Hills plant is 1.7 MVA and that of the Bergendal plant is 1 MVA. The two plants will be connected to the existing 11 kV underground cable reticulation systems of Hillandale and Bergendal respectively, using 11 kV underground cables that will run between above-ground miniature substations (minisub) and Ring Main Units (RMU).

The findings of the specialist studies undertaken within this EIA provide an assessment of

both the benefits and potential negative impacts anticipated as a result of the proposed PV solar farm. It was determined during the EIA that the proposed project will result in limited potential negative impacts and certain positive impacts. The majority of the negative environmental impacts will be experienced during the construction phase. The majority of these impacts will have a LOW significance. It is envisaged that these impacts can be easily mitigated and satisfactorily managed. The management of the impacts identified in the BAR for the construction and operational phases, are outlined in the EMPr.

The proposed site was regarded as suitable for the proposed PV solar farm due to the following:

- Accessibility to the existing 11kV underground cable reticulation systems of Hillandale and Bergendal using 11 kV underground cables that will run between above-ground miniature substations and Ring Main Units.
- Access via and existing gravel road.
- The locality within a public open space area away from residential units within the Woodland Hills Wildlife Estate which would minimise the visual impact.
- The locality directly adjacent to Mangaung's Northern Wastewater Treatment Works which already impacted the Sense of Place in that specific area.
- The site is not within a threatened veldtype/ecosystem. Although the site is within a ESA the overall biodiversity sensitivity is found to be Medium.
- The site is considered to be of low heritage significance.

The proposed layout for the Woodland Hills Solar Farm was selected based on the following parameters:

- Spatial orientation requirements of PV panels and associated infrastructure;
- Layout relative to other existing infrastructure, such as existing 11kV underground cable reticulation systems of Hillandale and Bergendal;
- Solar resource profile;
- Topographical constraints, including surface water; and
- Environmental constraints (no buffer zones were required).

Three technology alternatives were investigated:

- PV solar farm consisting of PV panels with a Battery Energy Storage System (BESS);
- PV solar farm consisting of PV panels with diesel generators; and
- PV solar farm consisting of PV panels only (Alternative 3)

A PV solar farm consisting of PV panels only was identified as the preferred alternative since this was the only option that was feasible from a financial point of view.

A detailed public participation process was followed during the EIA process which conforms to the public consultation requirements as stipulated in the EIA Regulations. In addition, all issues raised by I&APs will be captured in the FBAR and where possible, mitigation measures provided in the EMPr to address these concerns.

It is the opinion of Setala Environmental that there are presently no environmental impacts emanating from the proposed activity that cannot be adequately managed. The management of the negative impacts will require the implementation of the necessary mitigatory measures detailed in the Environmental Management Programme (EMPr, refer to Appendix G) of this report.

NO-GO ALTERNATIVE

The no-go Alternative is to not develop the site. Should the no-go Alternative be implemented, the area will remain undeveloped and unutilized and the status quo will remain the same.

Should the no-go alternative be considered the positive impacts associated with the proposed green energy project i.e. providing its own power to the Woodland Hills Wildlife Estate will not realize. In addition, no local employment opportunities during the construction and operational phases of the development will be created and no additional income to the local economy will be generated in the short or long term.

The no-go alternative is thus not considered a favourable option in light of the benefits associated with the proposed Woodland Hills PV Solar Farm; however, it will be used as a baseline from which to determine the level and significance of potential impacts associated with the Woodland Hills PV Solar Farm.

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 X	NO

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.

- The EMPr (attached in Appendix G) must be implemented and complied with to ensure the minimisation, control and mitigation of construction and post-construction phase impacts.
- Regular monitoring of the development footprint by the ECO to implement the Chance Find Procedure for heritage and palaeontology resources in case heritage resources are uncovered during the course of construction.
- Compliance with the EMPr should be evaluated and audited by an independent, appropriately qualified and experienced ECO, on a monthly basis, as a minimum.
- Mitigation measures provided by all specialists are to be adhered to.
- The project may only proceed based on approval from SAHRA:

Is an EMPr attached?	YES X	NO

The EMPr must be attached as Appendix G.

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: APPENDIXES

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