

**SITE SENSITIVITY VERIFICATION FOR THE PROPOSED DAISY AND KLEINZEE
SOLAR PV FACILITIES AND ASSOCIATED GRID CONNECTION
INFRASTRUCTURE, NORTHERN CAPE PROVINCE**

Produced for:

Energy Team (Pty) Ltd

On behalf of:



Savannah Environmental (Pty) Ltd
1st Floor, Block 2, 5 Woodlands Drive Office Park,
Cnr Woodlands Drive & Western Service Road
Woodmead, 2191

Produced by:



Lourens du Plessis (GPr GISc) t/a LOGIS
PO Box 384, La Montagne, 0184
M: 082 922 9019 E: lourens@logis.co.za
W: logis.co.za

- June 2023 -

LIST OF TABLES	2
LIST OF MAPS	2
LIST OF FIGURES	Error! Bookmark not defined.
DECLARATION	3
1. INTRODUCTION	4
2. METHODOLOGY	4
3. OUTCOME OF SITE SENSITIVITY VERIFICATION	5
4. CONCLUSION	10
5. REFERENCES	10

LIST OF TABLES

Table 1: Matrix to determine overall visual sensitivity for the proposed Daisy and Kleinzee Solar PV Facilities and associated grid connection infrastructure.....	9
--	---

LIST OF MAPS

Map 1: Relative landscape (solar) theme sensitivity as per the DFFE Screening Tool for the proposed Daisy and Kleinzee Solar PV Facilities and associated grid connection infrastructure.....	6
Map 2: Land cover and broad land use patterns within the study area	8

DECLARATION

I, **Lourens du Plessis**, as an independent consultant compiled this Scoping Visual Impact Assessment and declare that it correctly reflects the findings made at the time of the report's compilation. I further declare that I, act as an independent consultant in terms of the following:

- Do not have any financial interest in the undertaking of the activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act107 of 1998);
- Undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act,1998 (Act 107 of 1998);
- Based on information provided to me by the project proponent, and in addition to information obtained during the course of this study, will present the results and conclusion within the associated document to the best of my professional judgement.

Lourens du Plessis
Professional GISc Practitioner

1. INTRODUCTION

The development of two solar photovoltaic (PV) facilities with a contracted capacity of up to 360MW and 200MW is proposed by Energy Team (Pty) Ltd for the Daisy and Kleinzee Solar PV Facilities respectively, on sites located approximately 20km west of the town of Komaggas, and 24km southeast of Kleinzee. The project is located in the Nama Khoi Local Municipality within the Namakwa District Municipality, Northern Cape. The solar PV developments will be known as the Daisy and Kleinzee Solar PV Facilities. The Daisy and Kleinzee Solar PV Facilities are located within Focus Area 8 of the Renewable Energy Development Zones (REDZ), which is known as the Springbok REDZ, and within the Northern Corridor of the Strategic Transmission Corridors.

The infrastructure associated with the Solar PV facilities will include:

- Solar PV array comprising PV modules and mounting structures
- Inverters and transformers
- Low voltage cabling between the PV modules to the inverters
- 33kV cabling between the project components and the facility substation
- 132kV onsite facility substation
- 132kV power line to connect to the grid at Zonnequa Collector Substation within a 300m wide and approximately 3.5km long corridor.
- Battery Energy Storage System (BESS)
- Site offices and maintenance buildings, including workshop areas for maintenance and storage
- Laydown areas
- Site access and internal roads.

The power generated by both the Daisy and Kleinzee Solar PV Facilities will be sold to Eskom and will feed into the national electricity grid. Ultimately, both the Daisy and Kleinzee Solar PV facilities and the associated grid connection infrastructure are intended to be part of the renewable energy projects portfolio for South Africa, as contemplated in the Integrated Resources Plan (IRP) and Renewable Energy Independent Power Producer Procurement (REIPPP) Programme.

The PV facilities will take approximately four months each to construct and the operational lifespan of the facilities is estimated at up to 30 years.

In accordance with GN 320 and GN 1150 (20 March 2020) of the NEMA EIA Regulations of 2014 (as amended), prior to commencing with a specialist assessment, a site sensitivity verification must be undertaken to confirm the current land use and environmental sensitivity of the proposed project areas as identified by the National Web-Based Environmental Screening Tool (i.e., Screening Tool).

2. METHODOLOGY

The site sensitivity verification visual assessment was undertaken using the following information sources:

- Topographical maps and GIS generated data were sourced from the Surveyor General, Surveys and Mapping in Mowbray, Cape Town;
- Chief Directorate National (CDN) Geo-Spatial Information, varying dates. *1:50 000 Topographical Maps and Data*.
- DFFE, 2018/2020. *National Land-cover Database 2018/2020 (NLC2018/2020)*.
- DFFE, 2022. *South African Protected Areas Database (SAPAD_OR_2022_Q2)*.
- JAXA, 2021. Earth Observation Research Centre. *ALOS Global Digital Surface Model (AW3D30)*.
- Google Earth Pro. *Up to date and recent satellite images*.
- Professional judgement based on experience gained from similar projects;
- Literature research on similar projects;
- Observations made and photographs taken during site visits;
- Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of NEMA

3. OUTCOME OF SITE SENSITIVITY VERIFICATION

3.1. AFFECTED ENVIRONMENT

The Daisy and Kleinsee Solar PV Facilities are located about 15km southwest of the town of Komaggas, and 24km southeast of Kleinsee, within the Springbok Renewable Energy Development Zone (REDZ), in the Nama Khoi Local Municipality. Regionally, the proposed Solar PV site is located approximately 80km west of Springbok within the Northern Cape Province. Existing roads will be used, wherever possible, to access the project site and development area. Access to the site will be from the current existing gravel Kleinsee to Komaggas secondary road that traverses north of the proposed development site. The site can also be accessed off a provincial gravel minor road that connects from the surfaced MR751 road located to the west of the project site.

The study area for visual assessment occurs on land that ranges in elevation from 165m above sea level (asl) to about 450m asl at the top of the local hills Graafwater se Kop and Byneskop. The lowest areas are associated with dry pans located to the west of the site.

The terrain surrounding the proposed site is generally flat, sloping gently westwards towards the shore. The terrain type of the region is described as slightly undulating plains. Low hills are present in the far east and south east of the study area.

The small town of Kleinsee lies about 24km north west of the proposed site. Large parts of the region are mine-owned, and as a result, significant diamond mining activities are evident, especially within a 7km band along the coast.

The region has a very low population density of 3 people per km². Roads include a number internal farm roads and one lower order secondary road extending to the east and west from Komaggas to Kleinsee.

Individual homesteads/farmsteads are scattered throughout the region.

Other than the mining activity located along the West Coast, the proposed development is also within the Northern Corridor of the Strategic Transmission Corridors. As a result, industrial infrastructure within the region includes a network of distribution power lines, a distribution substation in Kleinsee and the Gromis Transmission Substation. The study area is further traversed by the alignment of the Gromis to Juno 400kV overhead power lines, as well as, the Sandveld to Komaggas 66kV overhead power line running along the Kleinsee to Komaggas secondary road.

The desert climate of the study area is dry, receiving between 28mm and 123mm of rainfall per annum. Land cover is primarily low shrubland (Succulent Karoo) with localised areas of exposed rock and sand, as well as, dry pans. The vegetation type is Strandveld of the West Coast.

Since the proposed site is located within the Springbok REDZ a number of approved renewable energy applications are already located within the study area. These include the Kleinsee Wind Energy Facility (WEF), Zonnequa WEF, Kap Vley WEF and Namas WEF. Of note is that the proposed sites for the Daisy and Kleinsee Solar PV Facilities falls within the already approved development area of the Namas WEF.

The Namaqua National Park lies approximately 25km to the south east, just beyond the boundary of the Springbok REDZ and is therefore outside of the study area (and not shown on the maps). The park is not expected to be visually influenced by the proposed PV Cluster according to its current extent. Of note is that future expansion of the Namaqua National Park as part of the National Protected Areas Expansion Strategy (NPAES) is possible within the study area. Therefore, as a possible new associated 'receptor,' the potential future (and yet undetermined) visual impact upon future visitors and tourism development will need to be considered.

The greater region is generally seen as having a high scenic value and high tourism value potential. It is well known for its scenic natural beauty (West Coast as a whole) and annual wild

flower displays (Namaqualand). This occurs once a year between July and October, depending on a number of environmental factors, but mainly the occurrence and duration of rainfall. The length of the display is also highly variable.

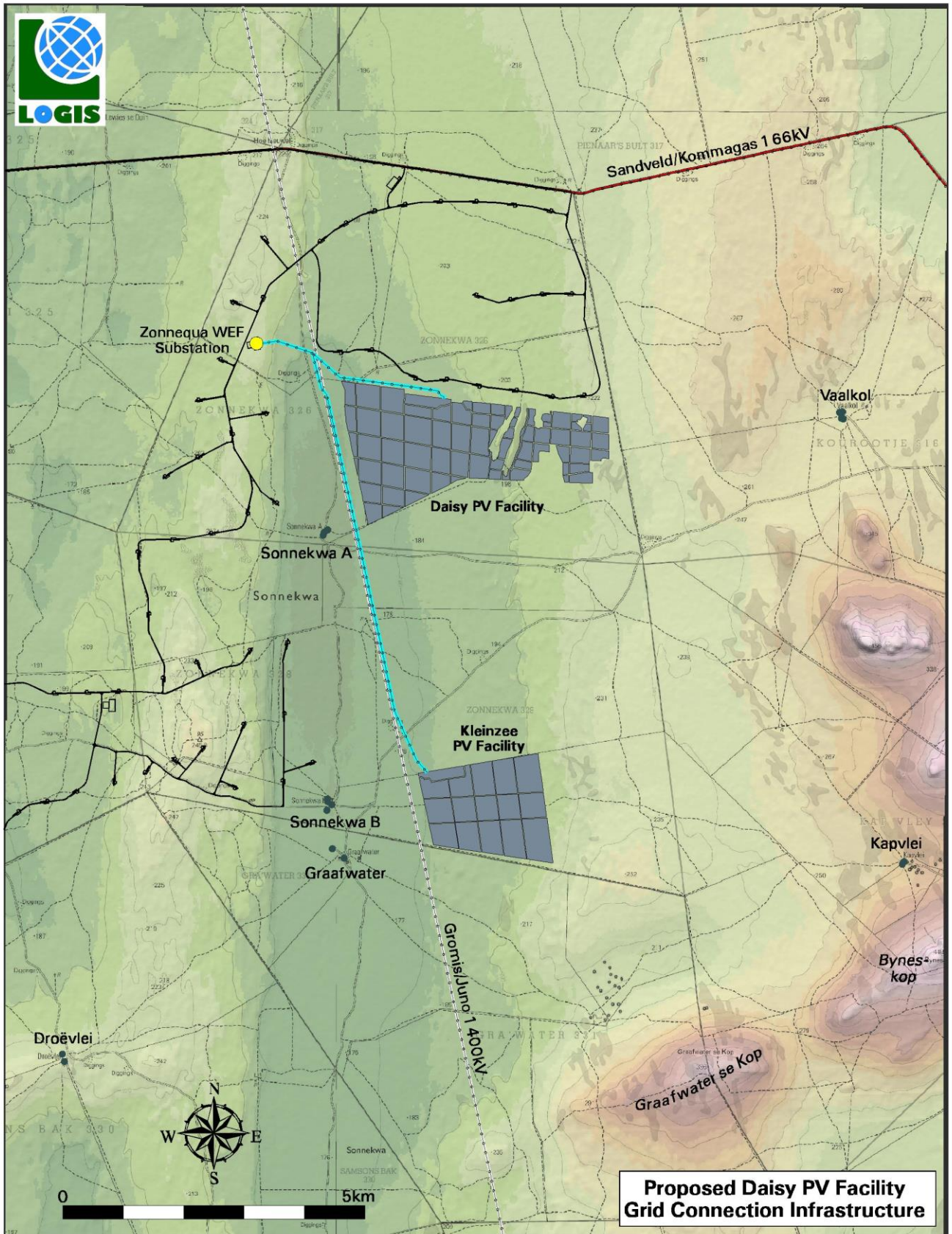
Within this scenic context, it is noteworthy that the mining areas along the coastline are significantly disturbed and visually apparent due to the scale and nature of the surface-based mining. In this respect the visual quality of the receiving environment is already impacted upon to some extent.

3.2. DFFE Screening Tool

The DFFE screening tool generated for the Daisy and Kleinzee Solar PV Facilities and associated grid connection infrastructure indicated that the facilities have a very high sensitivity owing to the fact that the sites are located on mountain tops and high ridges. Refer to **Map 1**.



Map 1: Relative landscape (solar) theme sensitivity as per the DFFE Screening Tool for the proposed Daisy and Kleinzee Solar PV Facilities and associated grid connection infrastructure



**Proposed Daisy PV Facility
Grid Connection Infrastructure**

LEGEND		Proposed Infrastructure		SHADED RELIEF Elevation above sea level (m)			
	Proposed development site identified for the PV Facility		Zonnequa WEF Layout				
	Secondary Road		Zonnequa WEF Collector Substation				
	Power Line		132kV Power Line				
	Homestead/Farmstead						

Map 2: Shaded relief map of the study area



LEGEND		Proposed Infrastructure		LAND COVER	
	Proposed development site identified for the PV Facility		Zonnequa WEF Layout		Low Shrubland (Succulent Karoo)
	Secondary Road		Zonnequa WEF Collector Substation		Dry Pans
	Power Line		132kV Power Line		Bare Rock & Soil
	Homestead/Farmstead				Grassland

Map 3: Land cover and broad land use patterns within the study area

3.3. RESULTS

In order to determine the overall visual sensitivity of the proposed sites in the absence of any mitigation, the following matrix was utilized:

Sensitive Receptor	Very High Sensitivity (4)	High Sensitivity (3)	Moderate Sensitivity (2)	Low Sensitivity (1)
Topographic features incl mountain ridges	Within 250 m	Within 250-500 m	Within 500m – 1 Km	>1 Km
Steep slopes	Slopes with more than 1:4	Slopes between 1:4 and 1:10	-	-
Major rivers, water bodies, perennial rivers and wetlands with scenic value	Within 250 m	Within 250-500 m	Within 500 m – 1 Km	>1 Km
Coastal zone	Within 1 Km	Within 1-2 Km	Within 2-3 Km	>3 Km
Protected area: National Parks	Within 2 Km	Within 2-4 Km	Within 4-6 Km	>6 Km
Protected areas: Nature Reserves	Within 1 Km	Within 1-2 Km	Within 2-3 Km	>3 Km
Private reserves and game farms	Within 500 m	Within 500m- 1 Km	Within 1-2 Km	>2 Km
Cultural landscape	On the site itself	Within 500 m	Within 500 m – 1 Km	>1 Km
Heritage Sites Grades I, ii and iii	On the site itself	Within 500 m	Within 500 m – 1 Km	>1 Km
Towns and Villages	Within 500 m	Within 500m- 1 Km	Within 1-2 Km	>2 Km
Home/farmsteads	Within 500 m	Within 500m- 1 Km	Within 1-2 Km	>2 Km
National Roads	Within 500 m	Within 500m- 1 Km	Within 1-2 Km	>2 Km
Provincial/arterial roads	Within 1 Km	Within 1-3 Km	Within 3-6 Km	>6 Km
Scenic routes	Within 500 m	Within 500m- 1 Km	Within 1-2 Km	>2 Km
Passenger rail lines	Within 250 m	Within 250 – 500 m	Within 500 m – 1 Km	>1 Km
Located with Renewable energy development zone	No	-	-	Yes- Springbok REDZ
VAC	Low VAC	Moderate VAC	High VAC	Very High VAC
Visual Quality	Natural environment intact with no built infrastructure	Natural environment intact with limited built infrastructure	Natural environment somewhat intact with fair amount of built infrastructure	Built infrastructure is dominant with little to no natural environment remaining
Presence of existing infrastructure	Absent	Very low densities	Present in moderate quantities	High densities
Total	Moderate (31)			

Table 1: Matrix to determine overall visual sensitivity for the proposed Daisy and Kleinzee Solar PV Facilities and associated grid connection infrastructure

Overall visual sensitivity rating:

- Low (0-20)
- Moderate (21-40)
- High (41-60)
- Very High (61-80)

Of note is that a potential future receptor within the study area and close proximity to both the proposed PV Facilities, are visitors to the Namaqua National Park should future expansion be undertaken as per the NPAES. Should these expansions take place it is expected that the above score will only slightly increase from Moderate (31) to Moderate (34).

4. CONCLUSION

The greater region is generally seen as having a high scenic value and high tourism value potential. It is well known for its scenic natural beauty (West Coast as a whole) and annual wild flower displays (Namaqualand), resulting in an overall moderate to high visual quality.

Within this scenic context, it is noteworthy that the mining areas along the coastline are significantly disturbed and visually apparent due to the scale and nature of the surface-based mining. In this respect the visual quality of the receiving environment is already impacted upon to some extent.

Visual Absorption Capacity (VAC) of the receiving environment is deemed low by virtue of the limited height (or absence) of the vegetation and the absence of urban development. In addition, the scale and form of the proposed structures mean that it is unlikely that the environment will visually absorb them in terms of texture, colour, form and light/shade characteristics.

The region has a very low population density of 3 people per km². Roads include a number internal farm roads and one lower order secondary road extending to the east and west from Komaggas to Kleinsee.

Homesteads and farmsteads, by virtue of their visually exposed nature, are considered to be sensitive visual receptors. Residential receptors in natural contexts are more sensitive than those in more built-up contexts, due to the absence of visual clutter in these undeveloped and undisturbed areas. Commuters and possible tourists using the secondary road may also be negatively impacted upon by the visual exposure to the proposed facilities, however, this intrusion would be fleeting.

The DFFE screening tool generated for the proposed Daisy and Kleinzee Solar PV Facilities and associated grid connection infrastructure indicated that both Solar PV Facilities and associated grid connection infrastructure has a very high sensitivity owing to the fact that the site is located on mountain tops and high ridges. Based on the above findings, it can be found that the sensitivity of the visual environment for the proposed Daisy and Kleinzee Solar PV Facilities and associated grid connection infrastructure is confirmed to be **moderate** due to:

- Low occurrence of visual receptors within 1km of the proposed facilities
- No provincial/ arterial roads located within 1Km
- Mountain tops and ridges located within 250m from the grid connection infrastructure
- No PV panels located on steep slopes, mountain tops or ridges
- Low VAC of the receiving environment

5. REFERENCES

Council for Scientific and Industrial Research (CSIR), 2015. *The Strategic Environmental Assessment for wind and solar photovoltaic energy in South Africa*.

DEADP, Provincial Government of the Western Cape, 2011. Guideline on Generic Terms of Reference for EAPS and Project Schedules.

Oberholzer, B. (2005). Guideline for involving visual and aesthetic specialists in EIA processes: Edition 1.

DEA, 2021. *South African Renewable Energy EIA Application (REEA) Database*.

Charlier, R & Thys, A. 2016. *Wind Power—Aeole Turns Marine*. 10.1002/9781119066354.ch7.