

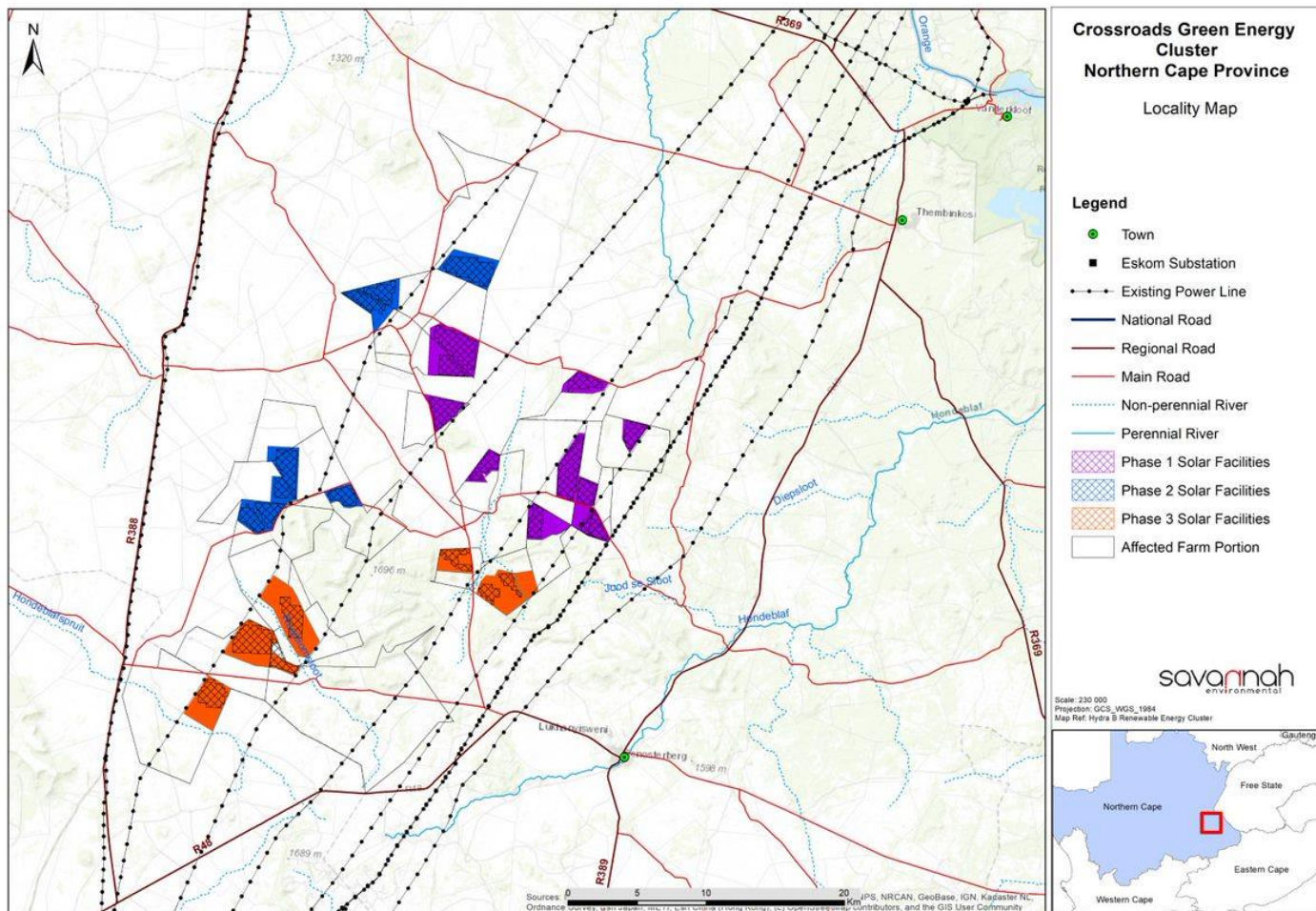
**SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPOSED ZIONSHEUVEL SOLAR PV FACILITY AND ASSOCIATED INFRASTRUCTURE ON REMAINDER OF FARM LEEUWBERG 79 IN THE RENOSTERBERG LOCAL MUNICIPALITY IN THE GREATER PIXLEY KA SEME DISTRICT MUNICIPALITY IN THE NORTHERN CAPE PROVINCE  
(DFFE REFERENCE: 14/12/16/3/3/2/2277)**

Zionsheuvél Solar Energy (Pty) Ltd (a consortium consisting of Akuo Energy Afrique, Africoast Investments and Golden Sunshine Trading) proposed to develop the Zionsheuvél Solar PV Facility and its associated electrical infrastructure on Remainder of Farm Leeuwberg 79 in the Renosterberg Local Municipality in the greater Pixley ka Seme District Municipality in the Northern Cape Province. The project site is located approximately 20km north of Philipstown and 30km west of Petrusville.

The Project (Zionsheuvél Solar PV Facility) is part of a cluster of solar facilities known as the Crossroads Green Energy. The Cluster entails the development of up to 21 solar energy facilities, each up to 240MW in capacity, and each including grid connection infrastructure connecting the facilities to the proposed Hydra B Substation<sup>1</sup>. Each solar energy facility will be constructed as a separate stand-alone project and therefore, separate Scoping and Environmental Impact Assessment (S&EIA) processes will be undertaken for each of the renewable energy facilities. The projects will be considered through the EIA process in batches, with Batch 1 consisting of 9 projects, Batch 2 considering 6 projects and Batch 3 considering 6 projects. Zionsheuvél Solar PV Facility forms part of the EIA process for Batch 1 consisting of 9 projects to be undertaken in 2023

The Zionsheuvél Solar PV Facility is proposed in response to the identified objectives of the national and provincial government and local and district municipalities to develop renewable energy facilities for power generation purposes. It is the developer's intention to bid the Zionsheuvél Solar PV Facility under the Department of Mineral Resources and Energy's (DMRE's) Renewable Energy Independent Power Producer Procurement (REIPPP) Programme, or similar renewable energy programme organized by public or private commercial & industrial customers through tenders or bilateral consultations, with the aim of evacuating the generated power into the national grid. This will aid in the diversification and stabilisation of the country's electricity supply, in line with the objectives of the Integrated Resource Plan (IRP), with the Zionsheuvél Solar PV Facility set to inject up to 240MW into the national grid.

From a regional perspective, the Northern Cape Province, and particularly the area under investigation, is considered favourable for the development of a commercial solar facility by virtue of prevailing climatic conditions (i.e. solar irradiation), relief, the extent of the affected properties, the availability of a direct grid connection (i.e., a point of connection of the national grid) and the availability of land on which the development can take place.



**Figure 1:** Locality map illustrating the location of the Crossroads Green Energy renewable energy cluster (Batch 1, Batch 2, and Batch 3)



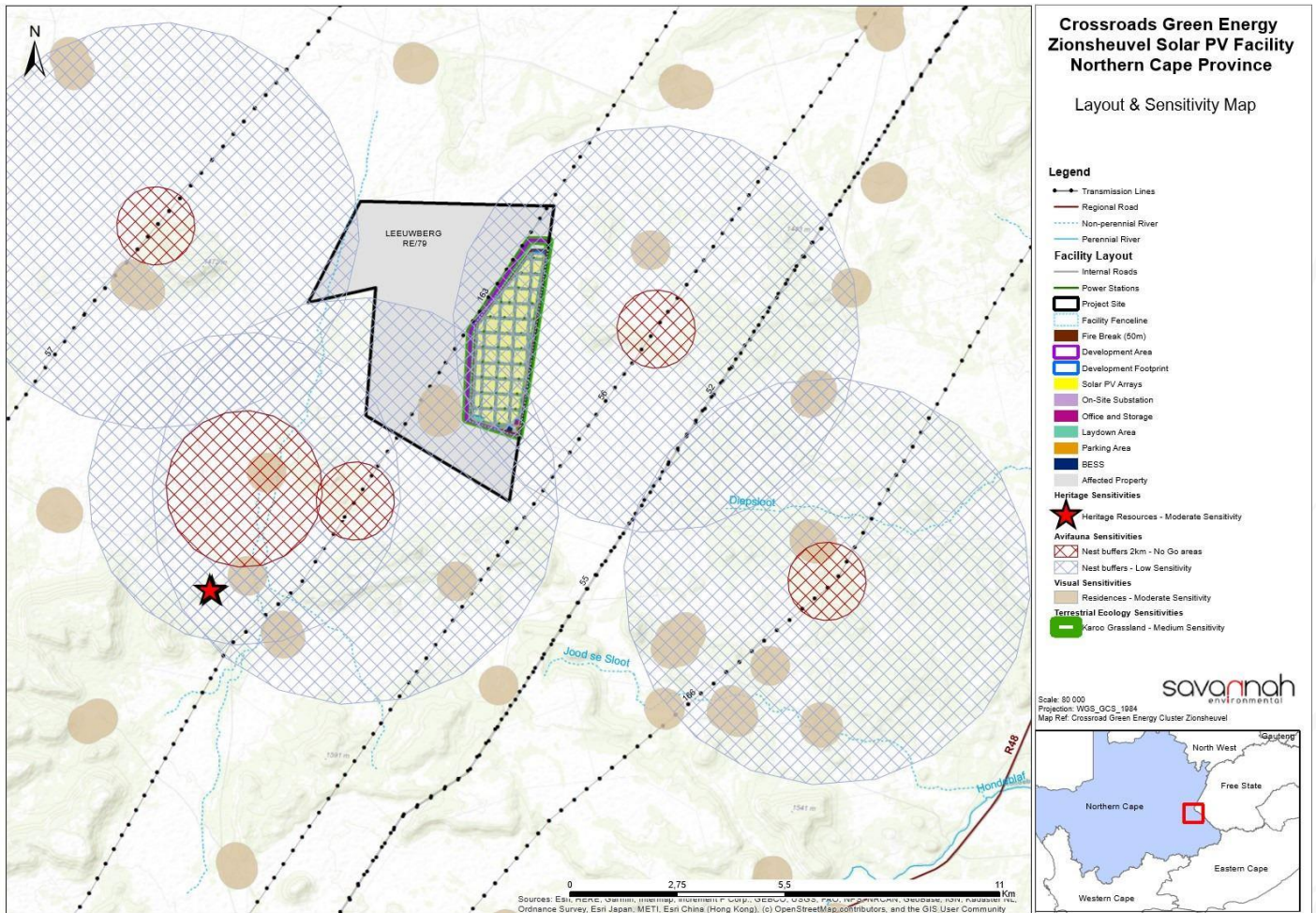


Figure 2: Zionsheuel Layout and Sensitivity Map

## SENSITIVITY VERIFICATION METHODOLOGY:

The site sensitivity verification report was compiled by the EAP and is based on specialist desktop information and field work undertaken as part of the S&EIA process. This report forms part of the Scoping and Environmental Impact Assessment (S&EIA) process being undertaken for the proposed Zionsheuvel Solar PV Facility and associated infrastructure on Remainder of Farm Leeuwberg 79 in the Renosterberg Local Municipality in the greater Pixley ka Seme District Municipality in the Northern Cape Province.

## SITE SENSITIVITY VERIFICATION:

The table below and reference to specialist assessments serve to:

- » Verify land use and sensitivities identified in the screening report; and
- » Confirm / contest the need for the various specialist inputs called for in terms of the screening tool report.

Environmental Theme/Specialist Assessment	Sensitivity Rating as per the Screening Tool (relating to the need for the study)	Verification of Site Sensitivity
Agriculture	High	<p>The proposed Zionsheuvel Solar PV Facility and associated infrastructure project the most sensitive soil forms that can be expected within the assessment corridor is the Hutton and Oakleaf soil forms. The land capability sensitivities (DAFF, 2017) indicate land capabilities with "Very Low to Moderate" sensitivities, which correlates with the requirements for a compliance statement only.</p> <p>The available climate can limit crop production significantly. The harsh climatic conditions are associated with low annual rainfall and high evapotranspiration potential demands of the area. The area is not favourable for most cropping practices.</p> <p>The proposed project will have limited impact on the agricultural production ability of the land. Additionally, the solar facility and associated infrastructure will not result in the segregation of any high production agricultural land.</p> <p>A Soils and Agricultural Potential Compliance Statement is included in the EIA Report as <b>Appendix G</b>.</p>
Animal Species	Medium	<p>The main expected impacts of the proposed infrastructure will include the following:</p> <ul style="list-style-type: none"> <li>» Habitat loss and fragmentation as well as degradation of surrounding habitat;</li> <li>» Disturbance and displacement caused during the construction and maintenance phases; and</li> <li>» Direct mortality during the construction phase.</li> </ul> <p>The primary expected impacts of the proposed project will be the loss of habitat and emigration of fauna. Based on the outcomes of the SEI determination, the PAOI is considered to have a Medium SEI which indicated that minimisation mitigation must be applied to the site.</p>

Environmental Theme/Specialist Assessment	Sensitivity Rating as per the Screening Tool (relating to the need for the study)	Verification of Site Sensitivity
		<p>It must be noted, when taken into consideration in conjunction with the other Solar PV facilities planned for all three phases of the overall proposed development, that the cumulative fragmentation of the ESA is very high. The associated cumulative fragmentation impacts are expected to be high for the overall development. This project should ideally not be considered in isolation but rather as a part of the full proposed development when considering impacts to the ESA.</p> <p>Considering that this area has been identified as being of significance for biodiversity maintenance and ecological processes (ESA), development may proceed but with caution and only with the implementation of mitigation measures. Considering the above-mentioned information, no fatal flaws are evident for the proposed project. It is the opinion of the specialists that the project may be favourably considered, on condition that all prescribed mitigation measures and supporting recommendations are implemented.</p> <p>A Terrestrial Biodiversity Assessment has been undertaken for the Solar Energy Facility and is included as <b>Appendix D</b> of the EIA Report.</p>
Archaeological and Cultural Heritage	Low	<p>According to the DFFE Screening Tool analysis, the development area has High levels of sensitivity for impacts to palaeontological heritage and Low levels of sensitivity for impacts to archaeological and cultural heritage resources. The results of this assessment in terms of site sensitivity are summarised below:</p> <ul style="list-style-type: none"> <li>» No significant archaeological resources were identified within the broader area (Low)</li> <li>» The limited excavations associated with the PV facility development should not impact significant palaeontological heritage (Moderate)</li> </ul> <p>As per the findings of this assessment, and its supporting documentation, the outcome of the sensitivity verification confirms the results of the DFFE Screening Tool for Archaeology and disputes the results of the screening tool for Palaeontology - this should be considered to be Moderate.</p> <p>A Heritage Impact Assessment has been undertaken for the Solar PV Facility and is included as <b>Appendix H</b> of the EIA report.</p>
Palaeontology	High	<p>According to the DFFE Screening Tool analysis, the development area has High levels of sensitivity for impacts to palaeontological heritage and Low levels of sensitivity for impacts to archaeological and cultural heritage resources. The results of this assessment in terms of site sensitivity are summarised below:</p> <ul style="list-style-type: none"> <li>» No significant archaeological resources were identified within the broader area (Low)</li> <li>» The limited excavations associated with the PV facility development should not impact significant palaeontological heritage (Moderate)</li> </ul>

Environmental Theme/Specialist Assessment	Sensitivity Rating as per the Screening Tool (relating to the need for the study)	<b>Verification of Site Sensitivity</b>
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As per the findings of this assessment, and its supporting documentation, the outcome of the sensitivity verification confirms the results of the DFFE Screening Tool for Archaeology and disputes the results of the screening tool for Palaeontology - this should be considered to be Moderate.

A Heritage Impact Assessment has been undertaken for the Solar PV Facility and is included as **Appendix H** of the EIA report.

Terrestrial Biodiversity

Very High

One (1) habitat type (vegetation community) was delineated within the assessment area. All habitats within the project area of the proposed development were allocated a sensitivity category or SEI, which is considered a combined SEI for Terrestrial Biodiversity, Animal Species and Plant Species Themes.

Summary of habitat types delineated within the project area is provided in the table below.

Habitat Type	Description	Ecosystem Processes and Services	Conservation Importance (CI)	Functional Integrity (FI)	Biodiversity Importance (BI)	Receptor Resilience (RR)	Guidelines for interpreting SEI in the context of the proposed development activities
<b>Karoo Grassland</b>	Karoo shrubs and grasses on flat plains, homogeneous in nature.	Provides foraging areas for fauna, provides landscape-level; pollination and dispersal.	<b>Medium</b> > 50% of receptor contains natural habitat with potential to support SCC.	<b>High</b> Large (> 20 ha but < 100 ha) intact area for any conservation status of ecosystem type.	<b>Medium</b>	<b>Medium</b> Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor	<b>Medium</b> Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.

A Terrestrial Biodiversity Assessment has been undertaken for the Solar Energy Facility and is included as **Appendix D** of the EIA Report.

Environmental Theme/Special Assessment	Sensitivity Rating as per the Screening Tool (relating to the need for the study)	Verification of Site Sensitivity
Aquatic Biodiversity	Very High	<p>One (1) form of a watercourse was identified and delineated within the regulated area. This includes an ephemeral river (watercourse). No natural wetland systems, or even cryptic wetlands were identified for the area. The proposed development area is more than 650 m south of the watercourse. A borrow pit with no drainage was identified within the project area, but this is not considered to be a natural water resource. The results of the habitat assessment indicates natural (class A) and largely natural (class B) instream and riparian conditions for the watercourse catchment respectively. The recommended buffer was calculated to be 20 m for the river. A site sensitivity verification forms part of reporting requirements. In this regard, the allocated sensitivities of low for the general area and medium sensitivity for the drainage features agrees with the Environmental Screening Tool. The project must take cognizance of this and avoid any unnecessary disturbance of the drainage features and adjacent habitat. Therefore, the aforementioned post-mitigation buffer should be implemented and treated as 'no go areas'.</p> <p>The development footprint is not located within 100 m of the delineated water resource [as per the National Water Act, 1998 (Act No. 36 of 1998) in accordance with GN509 of 2016 as it relates to the National Water Act, 1998 (Act 36 of 1998), a regulated area of a watercourse in terms of water uses as listed in Section 21(c) and 21(i)].</p> <p>Since the development footprint is outside of the regulation zone and buffer zone, no risks to the freshwater systems are foreseen for the proposed project. Therefore, no impacts or risks were anticipated to the freshwater systems and therefore not assessed in this report. Despite the absence of risks expected for the project, this report presents supporting mitigation and management measures for consideration.</p> <p>No fatal flaws were identified for the project, and the development may be favourably considered and all prescribed mitigation measures must be considered by the issuing authority. No monitoring measures are deemed necessary for the development.</p> <p>A Freshwater Ecology Compliance Statement has been undertaken for the Solar Energy Facility and is included as <b>Appendix F</b> of the EIA Report.</p>
Avian	Low	<p>Sensitivities were compiled for the avifauna study based on the field results and desktop information. All habitats within the assessment area of the proposed project were allocated a sensitivity category. The Water resources and Nest buffers were given a very high sensitivity based on the low receptor resilience these areas and species will have to change. The Karoo scrubland and Karoo Grasslands all support a large number of SCCs (9 species), the biodiversity importance of these areas are thus high.</p> <p>Summary of habitat types delineated within the project area is provided in the table below.</p>

Environmental Theme/Specialist Assessment	Sensitivity Rating as per the Screening Tool (relating to the need for the study)	Verification of Site Sensitivity					
		Habitat	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance
		Karoo grassland	High	High	High	Medium	High
		Karoo scrubland	High	High	High	Medium	High
		Water resources	High	High	High	Low	Very High
		Nest buffers (Core)	High	High	High	Low	Very High
		Nest Buffers (Outside)	High	High	High	Medium	High
		An Avifauna Specialist Assessment has been undertaken for the Solar Energy Facility and is included as <b>Appendix E</b> of the EIA Report.					
Civil Aviation (Solar PV)	Low	No major aerodromes or small airfields are known to occur in the larger area. The Civil Aviation Authority (CAA) and Air Traffic Navigation Services (ATNS) will be consulted throughout the S&EIA process to obtain input. No objections have been received to date.					
Defence	Low	The project site is not located within close proximity of any military base or infrastructure. The low sensitivity rating is supported, and no study is required in this regard.					
RFI	Medium	The project site under consideration is not located near a telecommunications tower. Relevant telecommunications service providers will be consulted during the Scoping&EIA process to obtain any relevant comments regarding the proposed project. In addition, SARAQ will be consulted regarding any specific requirements in terms of the SKA. A Compliance Statement has been compiled and is included as <b>Appendix Q</b> of the EIA Report.					
Plant Species	Low	<p>One (1) habitat type (vegetation community) was delineated within the assessment area. All habitats within the project area of the proposed development were allocated a sensitivity category or SEI, which is considered a combined SEI for Terrestrial Biodiversity, Animal Species and Plant Species Themes.</p> <p>Summary of habitat types delineated within the project area is provided in the table below.</p>					



Environmental Theme/Specialist Assessment	Sensitivity Rating as per the Screening Tool (relating to the need for the study)	<b>Verification of Site Sensitivity</b>							
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Habitat Type	Description	Ecosystem Processes and Services	Conservation Importance (CI)	Functional Integrity (FI)	Biodiversity Importance (BI)	Receptor Resilience (RR)	Guidelines for interpreting SEI in the context of the proposed development activities
<b>Karoo Grassland</b>	Karoo shrubs and grasses on flat plains, homogeneous in nature.	Provides foraging areas for fauna, provides landscape-level; pollination and dispersal.	<b>Medium</b> > 50% of receptor contains natural habitat with potential to support SCC.	<b>High</b> Large (> 20 ha but < 100 ha) intact area for any conservation status of ecosystem type.	<b>Medium</b>	<b>Medium</b> Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor	<b>Medium</b> Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.

A Terrestrial Biodiversity Assessment has been undertaken for the Solar Energy Facility and is included as **Appendix D** of the EIA Report.

Socio-Economic Assessment	The screening report does not indicate a rating for this theme.	A Socio-Economic Impact Assessment has been undertaken and is included in the EIA Report as <b>Appendix K</b> .							
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Traffic Impact Assessment	The screening report does not indicate	The construction and decommissioning phases of a development is the only significant traffic generator and therefore noise and dust pollution will be higher during this phase. The duration of this phase is short term i.e., the impact of the traffic on the surrounding road network is temporary and solar facilities, when operational, do not add any significant traffic to the road network.							
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Environmental Theme/Special Assessment	Sensitivity Rating as per the Screening Tool (relating to the need for the study)	Verification of Site Sensitivity
	a rating for this theme.	<p>The development is supported from a transport perspective provided that the recommendations and mitigations contained in this report are adhered to.</p> <p>The impacts associated with the facility are acceptable with the implementation of the recommended mitigation measures and can therefore be authorised.</p> <p>A Traffic Impact Assessment has been undertaken and is included in the EIA report as <b>Appendix I</b>.</p>
Visual Impact Assessment	The screening report does not indicate a rating for this theme.	<p>The findings of the Visual Impact Assessment undertaken for the proposed Zionsheuvel Solar PV Facility is that the visual environment surrounding the site, especially within a 1km radius (and potentially up to a radius of 3km) of the proposed facility, may be visually impacted during the anticipated operational lifespan of the facility (i.e. a minimum of 20 years).</p> <p>The following is a summary of impacts remaining:</p> <ul style="list-style-type: none"> <li>» Construction activities may potentially result in a high temporary visual impact, that may be mitigated to moderate</li> <li>» The operation of the proposed PV facility is expected to have a high visual impact pre-mitigation and a moderate visual impact post mitigation on the residents of Zionsheuvel and observers/visitors travelling along the secondary roads within a 1km radius of the PV facility.</li> <li>» The operational facility could have a high visual impact which may be mitigated to moderate on observers travelling along the secondary road within 1 – 3km radius of the facility.</li> <li>» The operational facility could have a moderate visual impact which may be mitigated to low on observers travelling along the secondary roads within 3 – 6km radius of the facility.</li> <li>» The operational facility could have a low visual impact both pre and post mitigation on residents/visitors to various homesteads as well as observers travelling along the various secondary roads beyond the 6km radius of the facility.</li> <li>» This anticipated lighting impact is likely to be of high significance and may be mitigated to moderate especially within 0-3km radius of the PV facility.</li> </ul>

Environmental Theme/Special Assessment	Sensitivity Rating as per the Screening Tool (relating to the need for the study)	Verification of Site Sensitivity
		<ul style="list-style-type: none"> <li>» The potential visual impact related to solar glint and glare as a road travel hazard is therefore expected to be of low significance. No mitigation of this impact is required since the solar reflection is predicted towards a local/secondary road.</li> <li>» There is a single affected residence, Zionsheuvel, within a 1km radius of the proposed PV facility. The potential visual impact related to solar glint and glare on static ground-based receptors (residents of homesteads) is therefore expected to be of moderate significance before mitigation and low post mitigation.</li> <li>» The anticipated visual impact resulting from ancillary infrastructure is likely to be of low significance both before and after mitigation.</li> <li>» Decommissioning activities may potentially result in a high, temporary visual impact that may be mitigated to moderate.</li> <li>» The anticipated significance of the visual impacts on the sense of place within the region (i.e. beyond a 6 km radius of the development and within the greater region) is expected to be of Moderate significance.</li> <li>» The anticipated cumulative visual impact of the proposed facility is expected to be of high significance.</li> </ul> <p>The anticipated visual impacts listed above (i.e. post mitigation impacts) range from prominently moderate to low significance. One visual impact of high is anticipated in terms of the cumulative visual impact of the proposed Phase 1 of the Crossroads Green Energy Cluster. Anticipated visual impacts on sensitive visual receptors (if and where present) in close proximity to the proposed Zionsheuvel Solar PV Facility are not considered to be fatal flaws for the proposed PV facility.</p> <p>A Visual Impact Assessment has been undertaken and is included in the EIA report as <b>Appendix J</b>.</p>

Based on the outcomes of the Scoping Phase evaluation of the project and the outcomes of the Site Sensitivity Verification, the following studies were identified as being required:

- » Terrestrial Ecology Impact Assessment
- » Palaeontology (Heritage) Impact Assessment
- » Soils and Agricultural Potential Compliance Statement
- » Aquatic Impact Assessment

- » Avifauna Assessment
- » Social Impact Assessment
- » Traffic Impact Assessment
- » Visual Impact Assessment

The specialist studies undertaken for this project are required to comply with either the above Protocols or, alternatively, with the requirements of Appendix 6 of the NEMA EIA Regulations of 2014 (as amended 2017 & 2021).