

# KEIMOOES, PORTION ERF 666: SOLAR ENERGY FACILITY

## VISUAL ASSESSMENT ADDENDUM A

For consideration in the Basic Assessment

For

EnviroAfrica

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Addendum A (March 2017) to original Report (2012)

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**Relevant Qualifications & Experience of the Author**

Ms Sarien Lategan holds a Honours Degree in Geography as well as a Masters Degree in Town and Regional Planning from the University of Stellenbosch. She has 7 years experience as Town planner at a local government, 3 years with South African national Parks as planner and project manager of various GEF and World Bank managed, tourist facilities in the Table Mountain National Park and since 2004 as private practitioner involved in inter alia Site Analysis and Visual Impact assessments for various types of developments ranging from housing, tourism to infrastructure developments.

Ms Lategan is registered as a professional Town and Regional Planner as well as Environmental Assessment Practitioner.

**Declaration of Independence**

I, Sarah C. Lategan, fully authorized by Geostratics CC, declare that I am an independent consultant to EnviroAfrica and neither myself nor Geostratics, has any business, financial, personal or other interest in the proposed project or application in respect of which I was appointed, other than fair remuneration for work performed in connection with the application. There are furthermore no circumstances which compromise my objectivity in executing the task appointed for.



SC Lategan

## EXECUTIVE SUMMARY

Sarien Lategan of Geostratics was appointed to undertake the visual impact assessment of a maximum 10Megawatt solar facility, as input to the Basic Assessment in terms of the National Environmental Management Act, 1998 (Act no. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2010 by undertaken EnviroAfrica. The development of the solar farm is proposed by Keren Energy (Pty) Ltd. The site on which the facility is planned comprises a portion of Erf 666, Keimoes and in ownership of the Kai Garib local municipality..

An environmental authorization was obtained but has since expired. A new application will now be submitted for which the original VIA needs to be re-assessed to accommodate any changes that may have occurred since the original assessment as well as include an assessment of cumulative impacts. This report serves as an addendum to the original VIA for this purpose and should be read with the original report.

At the time of the original assessment a final decision was not yet been taken on the exact technology or mix of technology to be used in the development and therefore the worst case scenario was followed by assessing the technology most probably going to have the highest visual impact in terms of size of structures. For the purposes of the original study thus, tracking CPV units of dimensions 15,64m in height and 17m wide has been assessed. The technology currently proposed comprise single axis tracking system with a max tilt of 50°. This setup results in infrastructure to be significantly lower than the units assessed in the original VIA and therefore has a significant lower visual impact.

The overall conclusion in the original assessment was that the visual impact is within acceptable levels and could thus be recommended. Due to the nature of the type of technology, little mitigation measures can be implemented to further reduces any potential visual impacts. With the technology now proposed the visual impact is even further reduced.

With regard to cumulative impacts it is concluded in this addendum that no significant cumulative visual impacts will arise from the development and it is thus within the acceptable level of change.

It can thus be concluded that the overall visual impact of the new application is similar and even slightly less than the original proposal and from a visual perspective can be considered for approval. No additional mitigation measures are required.

## 1 OBJECTIVE

In 2012, Sarien Lategan of Geostratics was appointed to undertake the visual impact assessment of a maximum 10Megawatt solar facility, as input to the Basic Assessment in terms of the National Environmental Management Act, 1998 (Act no. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2010 by undertaken EnviroAfrica. The development of the solar farm is proposed by Keren Energy (Pty) Ltd. The site on which the facility is planned comprises a portion of Erf 666, Keimoes and in ownership of the Kai Garib local municipality.

An environmental authorization was obtained but has since expired. A new application will now be submitted for which the original VIA needs to be re-assessed to accommodate any changes that may have occurred since the original assessment as well as include an assessment of cumulative impacts. This report serves as an addendum t.o the original VIA for this purpose and should be read with the original report.

The objective of this addendum is to access changes that occurred since the original VIA and the subsequent impact thereof on the recommendations. It will futher more also assess the cumulative impacts of the proposal.

The changes that may have occurred includes the following:

1. Changes in the proposal namely -
  - a. Site boundary
  - b. Extent of solar production
  - c. Technology
2. Changes in the receiving environment

Cumulative impact holds two components namely the visual catchment area of assement and the criteria as defined by the DEA guideline on cumulative impacts.

It is important to note that the original VIA did assess impacts within the normal visual sphere of observation namely 30km.

## 2 CHANGES IN PROPOSAL

### 2.1 Site Boundary

The site boundary remained similiar to the effect that it will not change the assessment of the receptors as per the original report. Therefore the previous assessment of receptors remains unchanged. The solar facility link to the adjacent substation with 22kV power lines and thus add no additional elements to the original assessment.



**Figure 1: Site boundary**

## 2.2 Extend of solar facility and power line connection

The proposal has been changed from the assessed extent of 10MW to a final proposal of 5MW. The footprint area however remains the same. The visual impact is thus similar to the original proposal.

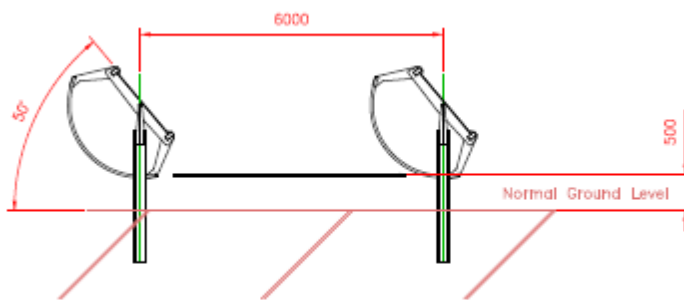
The proposed 22kV powerline is similar to telephone line in extent and connect to the adjacent Oasis substation within the original defined area of assessment.

## 2.3 Proposed Technology

At the time of the original assessment a final decision was not yet been taken on the exact technology or mix of technology to be used in the development and therefore the worst case scenario was followed by assessing the technology most probably going to have the highest visual impact in terms of size of structures. For the purposes of the original study thus, tracking CPV units of dimensions 15,64m in height and 17m wide has been assessed.

The technology currently proposed, comprise is a crystalline PV single axis plant. It has 18540 solar modules connected to 7 central inverters, and makes use of Exosun single axis trackers. The facility will be connected to Eskom's Ouplaas Substation.

This proposal result in significant downscale in the size of infrastructure being less intrusive. The original proposal comprise units of up to 6m in height where the PV single axis system is approximately 2m.



**Figure 2: Single axis mounting system**

No changes has been made to site parameter fencing and type of access roads.

The new proposed technology therefor reduce the visual impact with regard to the production technology.

## 3 CHANGES IN RECEIVING ENVIRONMENT

No changes occurred in the receiving environment which impact on the original assessment.

## 4 CUMULATIVE IMPACTS

### 4.1 Methodology

Ccumulative effects occur when:

- Impacts on the environment take place so frequently in time or so densely in space that the effects of individual impacts cannot be assimilated; or
- The impacts of one activity combine with those of another in a synergistic manner

DEAT has issued a guideline which identify types and characteristics of different cumulative effects.<sup>1</sup> Table 1 below summarise these criteria and these have been used to assess the cumulative visual impact.

**Table 1: Types and characteristics of cumulative impacts**

TYPE	CHARACTERISTIC
Time Crowding	Frequent and repetitive effects.
Time Lags	Delayed effects.
Space Crowding	High spatial density of effects.
Cross-boundary	Effects occur away from the source.
Fragmentation	Change in landscape pattern.
Compounding Effects	Effects arising from multiple sources or pathways.
Indirect Effects	Secondary effects.
Triggers and Thresholds	Fundamental changes in system functioning and structure.

DEAT also require that cumulative impacts of all energy projects within a 30km radius be assessed.

## 4.2 Assessment of cumulative impacts

### 4.2.1 Time Crowding

There are a number of PV sites to the east along the N14 and should these all commence with construction in the same timeframe, it will result in crowding during construction. However this is only temporary. and thus the impacts will be limited.

With regard to operational visual impact of a static land use change as proposed, this aspect is not relevant.

### 4.2.2 Time Lags

The facility does not change in its visual appeal over time and therefore there are no visual time lag effects.

### 4.2.3 Space crowding

The landscape consists of a valley with a hinterland to the north and south of this valley. The immediate hinterland to the south consist of hills and almost rocky/mountainous appearance. The hinterland to the north is more flat, but with interspersed hills, 'spitskoppe' and dunes. In general the area displays a surprisingly high variety in slope, hills, gradients and landform. These variations in landform reduce the visual reach and the view catchment of the area. The catchment area is thus restricted in the east, south and west to a maximum of 1km, but due to the up slope to the north and northwest the catchment area extent to the hills just north of the site at approx 4,5km. The maximum catchment area has thus been determined at approximately 5km.

(Refer Figure 3 below)

This thus concluded that the catchment area does not extent to the 30km radius. However a traveller on the N14 will be exposed to a number of solar energy site, especially towards the east. Most of the sites will most probably partially screened from the road and the view of these sites will occur at intervals for a distance of approximately 30km. This area is however a production landscape within which various infrastructure exist and the exposure can be absorb within the landscape. The proposal site adjacent to the substation also link the facility visually with the existing infrastructure and is close to town, thus resulting in an acceptable level of change.

<sup>1</sup> DEAT (2004) Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7, Department of Environmental Affairs and Tourism (DEAT), Pretoria

**4.2.4 Cross Boundary**

From a visual perspective the site has no cross boundary impacts.

**4.2.5 Fragmentation**

The position of the site adjacent the existing substation group it with similar infrastructure and thus not cause fragmentation of the visual landscape.

**4.2.6 Compounding Effects**

From a visual perspective the site has no compounding impacts.

**4.2.7 Indirect Effects**

The development is on the edge of the urban development and does has the potential to attract further development. The support services anticipated should however be of low impact such as general maintenance services as the facility does not require large scale industrial maintenance systems of equipment. The anticipated indirect visual effects are thus insignificant.

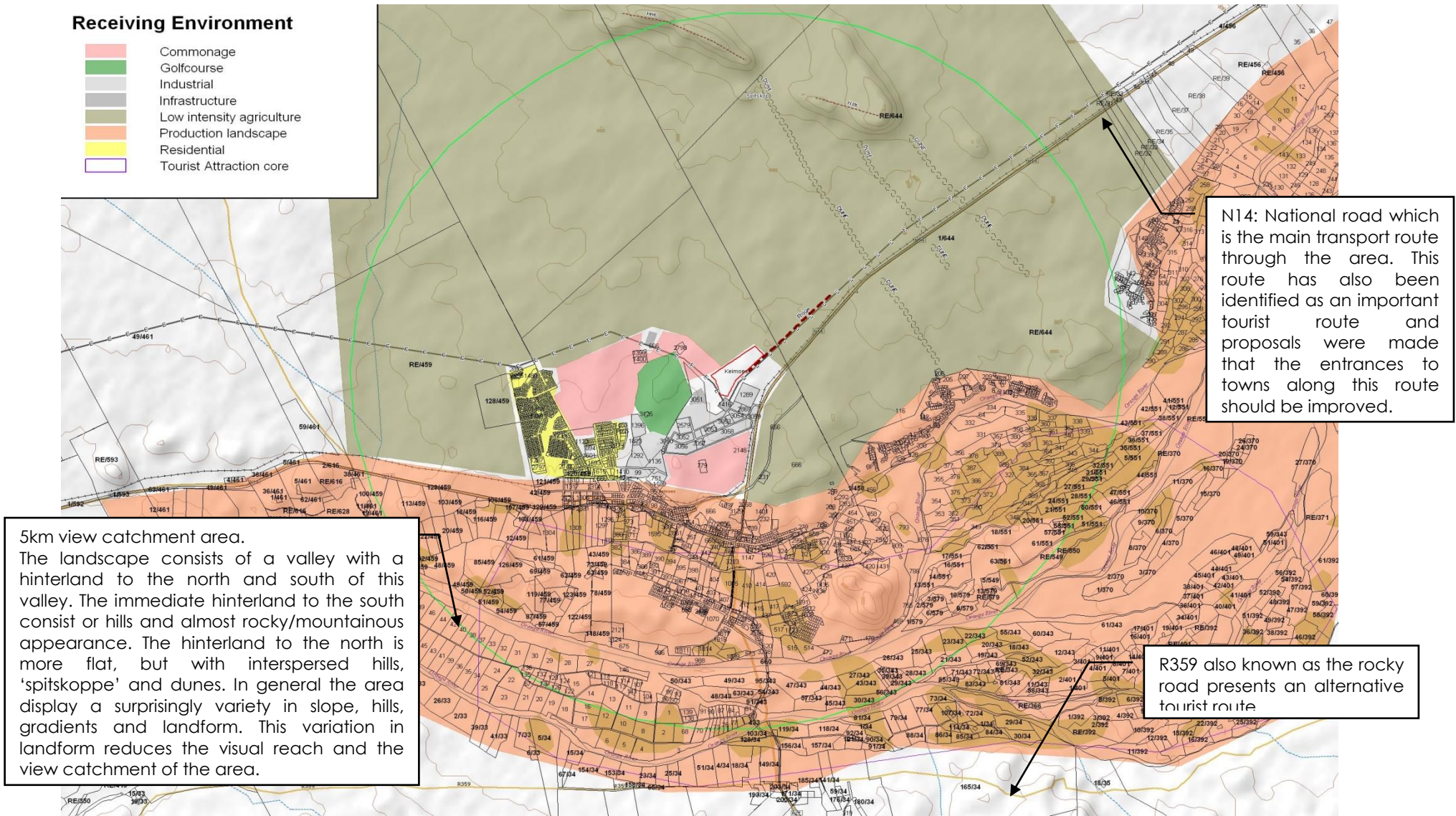
**4.2.8 Triggers and Thresholds**

From a visual perspective the site has no impacts on Triggers and Thresholds.



**Receiving Environment**

- Commonage
- Golfcourse
- Industrial
- Infrastructure
- Low intensity agriculture
- Production landscape
- Residential
- Tourist Attraction core



5km view catchment area. The landscape consists of a valley with a hinterland to the north and south of this valley. The immediate hinterland to the south consist or hills and almost rocky/mountainous appearance. The hinterland to the north is more flat, but with interspersed hills, 'spitskoppe' and dunes. In general the area display a surprisingly variety in slope, hills, gradients and landform. This variation in landform reduces the visual reach and the view catchment of the area.

N14: National road which is the main transport route through the area. This route has also been identified as an important tourist route and proposals were made that the entrances to towns along this route should be improved.

R359 also known as the rocky road presents an alternative tourist route

**Figure 3: View catchment and site elements**

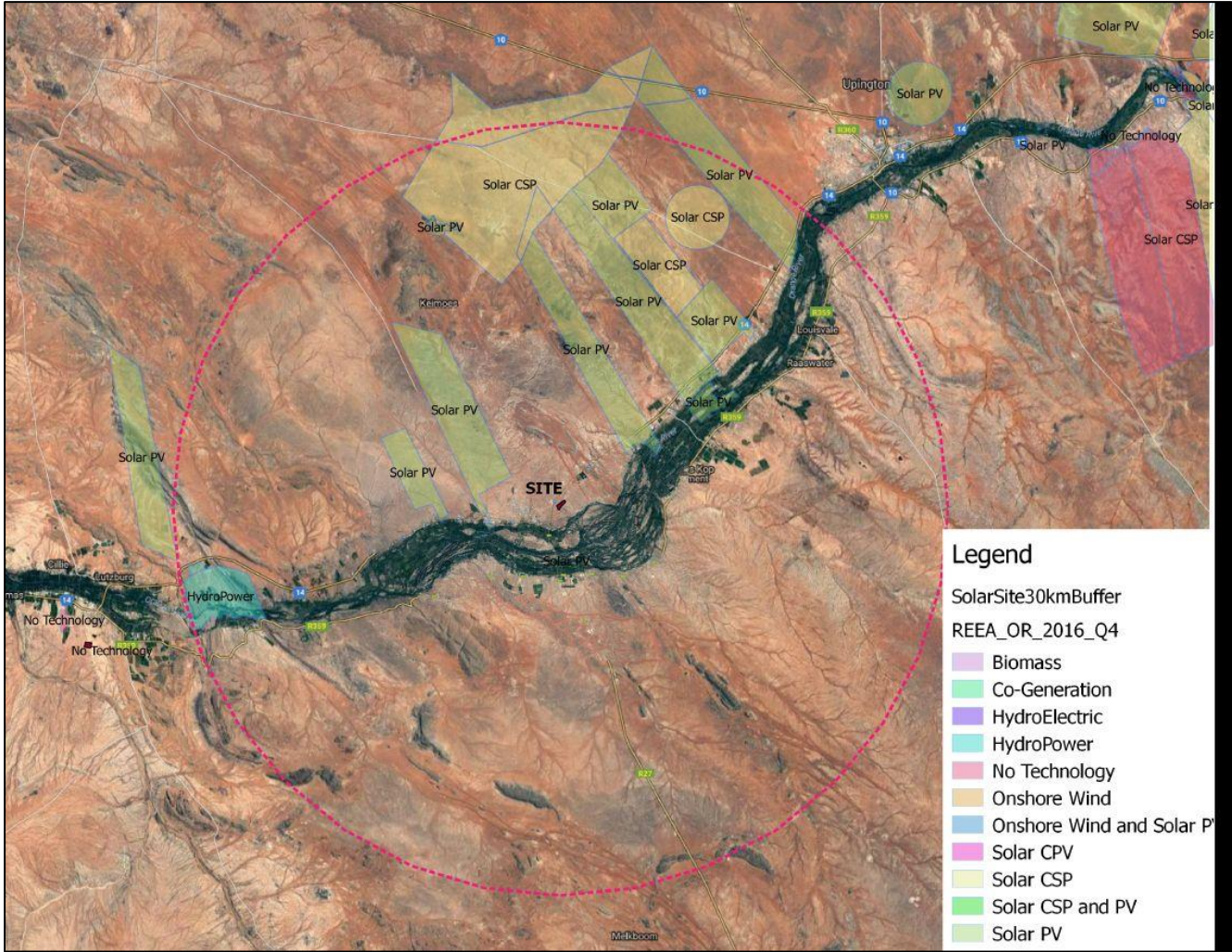


Figure 4: 30km radius

## 5 FINDINGS AND CONCLUSIONS

### 5.1 Construction Impacts

During construction, various large earth moving equipment and equipment will be transported to the site and work on the site. This will impact on the general experience of viewers. This impact is however temporary and not uncommon during construction of infrastructure. Communities have fairly high tolerance levels for such activities if it contributes to the infrastructure of the area.

Rating: Low

### 5.2 Operational Impacts

The proposed site is situated within the urban edge zone of Keimoes in an area characterized by little urban coherence nor rural, agricultural or wilderness sentiments. The larger area reflects the characteristics of a production to urban landscape and the site is situated within the land use continuum.

The valley area with its higher range of elements has a high visual absorption rate. The valley wall zones are not steep and therefore urban and infrastructure has developed on the areas. Due to their gradient they too reflect a high rate of visual absorption. Moving out of the valley area above the valley walls into the deep hinterland, the absorption rate reduces where the landscape is flat, but in areas with more gradient variation the absorption rate is still medium.

**Statement 1:** The nature and extent of the proposed development is such that it would not change the nature of land use of the area it is situated in.

**Statement 2:** Due to the medium to high absorption capacity of the landscape, the development will easily be absorbed into the existing visual structure.

**Statement 3:** The proposal does not pose any significant cumulative visual impacts which would deem the proposal unacceptable.

## 6 MITIGATION MEASURES

The level of visual impact is of such level that no mitigation to the proposed development elements is recommended. The impact can however be used as a resource by providing a tourist interpretation centre/facility to raise awareness amongst local residents and visitors to the site. Such facility can also serve as a practical demonstration of the region's commitment to sustainable development and responsible tourism and motivate the cumulative impacts as a benefit.