

GREENAM ELECTRICITY (PTY) LTD



KOKERBOOM PHOTOVOLTAIC POWER PROJECT

Annual Operational Monitoring Report

10 November 2021



PROJECT INFORMATION

Project Title: **GREENAM KOKERBOOM SOLAR PV PLANT, NAMIBIA**

Project Location: **PORTION 8 OF THE FARM KLEIN SPITZKOP NO. 153,
KEETMANSHOOP RURAL, //KARAS REGION**

Report Title: **ANNUAL OPERATIONAL MONITORING REPORT**

Report Date: **10 NOVEMBER 2021**

Competent Authority: **MINISTRY OF MINES AND ENERGY
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Approving Authority **DIRECTORATE OF ENVIRONMENTAL AFFAIRS
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10 November 2021
Date

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PART 1: INTRODUCTION

1.1 BACKGROUND

GreeNam Electricity (PTY) Ltd. ('GreeNam'), received environmental approval for the construction and operation of the 10MW Kokerboom PV power facility on Portion 8 (a portion of Portion 2) of the Farm Klein Spitskop No. 153, a portion adjacent to the existing NamPower Kokerboom Substation, located close to Keetmanshoop Town within the //Karas Region. In addition to the mentioned, environmental approval was also obtained for the construction and operation of a 66kV power transmission line.

In compliance with section 27 of the Environmental Management Act, 2007 (Act 7 of 2007), an Environmental Clearance Certificate (ECC) for the 10MW Kokerboom PV power facility was obtain during February 2016 and during July 2017 for the 66kV OHTL, as defined within Government Notice No. 29 of 2012. Since 2016/2017 the ECCs lapsed during February 2019 and July 2020, respectively, which is now being renewed. The ECC applicable to the 66kV OHTL will after renewal be transferred to NamPower, the owner of the OHTL.

After completion of the construction phase of the PV power facility and OHTL during December 2018, GREENAM appointed IBIS Environmental Social Governance Consulting South Africa (PTY) Ltd. to undertake the monitoring inspection and reporting, this was done during January 2019.

In compliance with the initial ECC (2016/2017), GREENAM appointed Urban GREEN cc to undertake the operational monitoring and evaluation of their on-site activities at the 10MW Kokerboom PV power facility and produce an annual report for submission with the Approving Authority and Competent Authority.

This report, the 1st Operational Monitoring Report, as part of Urban Green's scope of work is submitted with the Office of the Environmental Commissioner (Ministry of Environment and Tourism), as per the requirements of the ECC dated February 2016 & July 2017.

For purpose of consistency and keeping with the known format (i.e. Environmental Scoping Report with EMP, December 2015; Construction Completion Report, January 2019), information, the method of evaluation and reporting style from the mentioned Reports was included into Urban Green's reporting layout and method of evaluation.

1.2 OPERATIONAL MONITORING

1.2.1 OVERVIEW

Environmental monitoring is defined as *'an activity undertaken to provide specific information on the characteristics and functions of environmental and social variables in space and time'* and is therefore one of the most important components of an EIA with EMP, which is essential for:

- Ensuring that impacts do not exceed the legal standards;
- Checking the implementation of mitigation measures in the manner described in the EMP report, and
- Providing early warning to potential environmental and/or social concerns and/or impacts.

This Operational Monitoring Report, along with all other reports will serve the purpose of –

- Recording environmental and social compliance during the operational phase;
- Providing information to the Approving Authority and Competent Authorities; and
- Serve as supporting documentation on application for Environmental Clearance Certificate renewal.

Independent monitoring and reporting is one of the 10 principles of the Equator Principles in an attempt to establish an International Standard with which companies must comply with in order to apply for approved funding by Equator Principles Financial Institutions (EPFIs).

1.2.2 ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan (EMP) dated December 2015 was used according to which the on-site operational activities have been measured.

It is worth noting that the EMP dated December 2015 included for the entire project life cycle, i.e. planning to decommissioning, and that a standalone operational monitoring report was not compiled.

1.2.3 ROLES AND RESPONSIBILITY

In addition to the roles and responsibilities, as defined under section 8.3.1 of the Environmental Management Plan (December 2015), the Site Manager, Mr. Kaupuire Tjahuha, and the relevant environmental, health and safety (EHS) representative is responsible for daily compliance and monitoring thereof, as well as undertaking official bi-monthly monitoring inspection and reporting. Bi-monthly reports should be sent to the Environmental Consultant who again is responsible for submission with the office of the Environmental Commissioner.

Annual monitoring inspections and reporting is the responsibility of the independent and external environmental consultant, i.e. Urban Green cc. Annual monitoring reports will be submitted to GREENAM for record keeping on-site, as well as the office of the Environmental Commissioner.

Bi-monthly and annual reports will assist during application for environmental clearance certificate renewal, which is done on a 3-yearly basis.

1.2.4 DURATION & TIME FRAME

Operational monitoring has and will remain to be done over the entire operational period of the Project until decommissioning.

1.2.5 TASKS PERFORMED

In preparation of this annual monitoring report, the following tasks were undertaken –

- All environmental reports and documentation pertaining to the 10MW Kokerboom PV power facility and 66kV OHTL received from the Proponent was reviewed;
- An on-site monitoring inspection was undertaken on 2 November 2021, which included a visual inspection, guided by the EMP (dated December 2015);
- Verbal feedback was given to the Site Manager following the on-site monitoring inspection;
- Reporting and submission with GREENAM for action (if any) and on-site record keeping; and
- Submission of Operational Monitoring Report with the Approving Authority, i.e. Office of the Environmental Commissioner, Ministry of Environment and Tourism.

1.2.6 ASSUMPTIONS & LIMITATIONS

In undertaking the operational monitoring, as per the tasks above, the following assumptions and limitations apply:

- It is assumed that all the information provided by the Proponent is accurate and that all necessary information was disclosed; and
- It is assumed that all permit or licence requirements, other than the ECC, associated with the Project are in place and up to date.

Further to the above no other assumption and/or limitations apply.

This Report contains the professional opinions of Urban Green cc and the results of this report should not be considered a legal interpretation of existing regulations. Urban Green cc assumes no responsibility or liability for any errors in the information provided by the Proponent, or statements from sources outside of Urban Green cc, or consequences resulting from situations outside the scope of this operational monitoring inspection.

1.2.7 REPORT STRUCTURE

This report consists of the following.

- Part 1 – Introduction, providing a background to the Project, an overview to operational monitoring, the duration and time frame, monitoring responsibilities tasks performed, assumptions and limitations;

- Part 2 – Review against Environmental Management Plan and Reporting; and
- Appendixes:
 - Appendix A – Photo Review

PART 2: ENVIRONMENTAL REVIEW & REPORTING

2.1 INTRODUCTION

This part of the Operational Monitoring Report provides a summary of the findings following the on-site inspection of 2 November 2021 and corrections recommended for implementation by the Proponent.

For inspection and reporting purposes to GREENAM management, the measures and the level of compliance thereof have been flagged or scored by means of three (3) main colours i.e. green, orange and red, as explained in the Table 2.1 below.

Table 2.1 – Compliance Indicator

<i>Color Code</i>	<i>Level of Compliance</i>
Green	High level of compliance to the EMP and these areas should be maintained.
Orange	Not complying and should be brought in compliance with the EMP.
Red	Indicates serious transgression and require urgent and specific action.

2.2 FINDINGS

2.2.1 RECORD KEEPING & INDUCTIONS

All records related to the implementation of the management plan (e.g. site instruction book, induction records, safety training completed and environmental management plan) were available from the on-site office. The environmental consultant was subject to an induction on arrival.

Based on the on-site observations this particular aspect is rated as 'green' and in compliance with the EMP.

2.2.2 SITE LAYOUT AND FOOTPRINT

Since construction completion in December 2018 and the construction completion monitoring of January 2019 there was no change to the site layout or footprint of infrastructure.

This potential impact is accordingly rated as 'green' and in compliance with the EMP.

2.2.3 HAZARDOUS STRUCTURES (*section 8.4.1 of EMP*)

Objective	To prevent harm to third parties and animals as a result of project related structures.	<i>Compliance</i>
Goal	To operate in harmony with surrounding land users.	
Task	Install visual and written signage indicating hazards.	Y
	Maintain 24hr security presence with access control.	Y
Actions Required	None	

Sporadic repair work during the operational phase may present short term risks such as excavations and structures associated with earth- and civil works. The power generating infrastructure and associated power lines however presents more long term risks such as hazardous structures and potential electrocution. The danger of electrocution from the security fence, although minor, holds some nuisance. Aftercare of rehabilitated areas may also require workings which could pose a threat to third parties and animals.

The environmental study (December 2015) noted that the Project site is in a remote area and not in close proximity to settlements, and is thus not often frequented by third parties. In addition, the local population is accustomed to the dangers of electrical infrastructure, with the existing Kokerboom substation located adjacent to the site. Despite the severity of the potential impact, the potential for such incidents to occur is low.

From the on-site observations there were no excavations and/or earthworks taking place to the extend posing any danger to staff and/or third parties. 24/7 security is done by means of access control via the main entrance and security cameras along the boundary fence of the Project site. Warning signs are visible at the substation and on the electricity fence.

Given the above, this potential impact is rated as 'green' and in compliance with the EMP.

2.2.4 VISUAL AND SENSE OF PLACE (*section 8.4.2 of EMP*)

Objective	To prevent visual disturbance to surrounding land users.	<i>Compliance</i>
Goal	To operate in harmony with surrounding land users.	
Tasks	No further infrastructure development.	Y
	Dust control	Y
Actions Required	None	

The larger surrounding area to the GREENAM PV power facility and that of NamPower is defined by large open landscapes used for commercial agricultural activities, with the well-

known Giant’s Playground and Quiver Tree Forest located in close proximity.

The sense of place, which prior to construction of the PV power facility and OHTL, was dominated by bulk infrastructure (i.e. NamPower’s Kokerboom Substation and PV power facility, and OHTL)) and large open space, remained unchanged. The scale in footprint and height of the PV power facility in comparison to that of the adjacent NamPower substation is considered small with a limited cumulative visual impact and low disturbance to the sense of place to the west of the M29. With surrounding visual receptors located a significant distance and screened by the natural topography, the visual disturbance was and is considered of no significance.

Since construction completion there has been no change and/or additions to the PV power facility to potentially have any further impact on the visual and sense of place.

Given the above, this potential impact is rated as ‘green’ and in compliance with the EMP.

2.2.5 AIR QUALITY (section 8.4.3 of EMP)

Objective	To prevent unnecessary dust and fumes as result of the project.	<i>Compliance</i>
Goal	To ensure that surrounding land uses are not adversely impacted.	
Tasks	Manage on-site activities so as to not result in soil disturbance, i.e. avoid total clearance of ground vegetation cover.	<i>N</i>
	Rehabilitate areas of no vegetation cover.	<i>N</i>
	Adherence to appropriate speed limits.	<i>N</i>
	Treatment of the M29 surface adjacent to the project site.	<i>N</i>
	Ensuring that all project vehicles and diesel powered equipment are well maintained.	<i>Y</i>
	Ensure total vegetation clearance surrounding transformers and inverters.	<i>Y</i>
	Operational firefighting equipment available on site.	<i>Y</i>
	Trained personnel to attend to fires.	<i>Y</i>
	Maintain effective fire breaks along the site’s boundary	<i>Y</i>
Actions Required	Areas having no natural ground vegetation cover should be rehabilitated as per part 2 of the Soil Conservation and Rehabilitation Programme	
	Train responsible personnel on how to keep vegetation growth under control without removing vegetation from the ground.	
	Erect speed limit signs along entrance road (2 signs).	

Air quality in the larger area is defined as good, with few sources of pollutants of which the main source is that of dust, caused by vehicle movement on the bypassing M29 and windblown dust from exposed ground within the Project site and larger surroundings. For the larger part of the year, veld fires are absent having limited impact from time to time only.

Air quality remains good within the boundaries of the Project site and can expect to deteriorate slightly as a result of the areas without any natural vegetation cover and during the occurrence of a veld fires. Potential receptors of dust impacts include residents in scattered farm dwellings (the nearest located approximately 4.5 km south of the site) and farm staff, pedestrians on the M29, as well as tourists associated with the Quiver Tree Resort situated about 7.6 km to the south west. The closest and most directly affected would be the on-site staff.

Due to the renewable energy source and passive generation mechanism of the proposed power project, the operational phase will not have any direct emissions to the atmosphere; however, sporadic indirect emissions may occur during maintenance and repair work. Fires or the possible occurrence of fires are not associated with the operational phase of the Project and accordingly not expected to have any effect.

Due to the limited scale of the project, the low volumes of vehicles and diesel powered equipment, limited possibility of fires associated with the operational phase of the Project, exhaust fumes and smoke was listed as not to have any significant impact. Dust was however listed as a potential direct impact on third parties through inhalation, an indirect livelihood impact through impacts on grazing quality, as well as result in general disturbance to biodiversity. Fires on-site or wild fires within the surroundings hold a significant impact to air quality, although short lived and infrequent. The greatest cause of on-site fires exists with the explosion of transformers and/or inverters, hence the required total vegetation clearance and stone cover surface surrounding these equipment.

Considering the principle of retaining overall good ground cover throughout the Project site, apart from the entrance road to the Site Office, and almost no vehicle movement within the Project site, and amount of days of excessive winds, very little dust pollution should take place during the operational phase. The very low number of vehicle movement along the M29 is not expected to have any significant cumulative effect. Considering the limited natural vegetation ground cover throughout the site, the possible spread of fires is none.

Areas of no ground vegetation cover were observed during the site inspection, which will contribute to unnecessary and larger volumes of dust nuisance during windy days. The greatest impact of this would be on the on-site staff, with very little or no impact to any of the surrounding receptors.

Total clearance of ground cover should not be done, but rather retained to prevent dust pollution and erosion. It is important that the Site Manager provide proper training and guidance to the responsible personnel on how ground cover should be kept under control as to not have an impact on operations.

In general air quality and the impact thereon from on-site operational activities remain 'green', although concern is raised with respect to the amount of areas having no natural vegetation ground cover and possible impact of dust nuisance and pollution.

2.2.6 SOIL DISTURBANCE (section 8.4.4 of EMP) & CONTAMINATION (section 8.4.5 of EMP)

Objective	To protect and prevent contamination of soil resources.	<i>Compliance</i>
Goal	To ensure soil functionality and land capability are not lost.	
Tasks	Manage on-site activities so as to not result in soil disturbance, i.e. avoid total clearance of ground vegetation cover.	N
	Rehabilitate areas of no vegetation cover.	N
	Manage on-site activities so as to not result in soil pollution.	Y
	Maintain readiness of spill response personnel and equipment.	Y
	Remediation and rehabilitation of areas affected by contamination.	Y
Actions Required	Areas having no natural ground vegetation cover should be rehabilitated as per part 2 of the Soil Conservation and Rehabilitation Programme.	
	Train responsible personnel on how to keep vegetation growth under control without removing vegetation from the ground.	

The eutric leptosol soils found on-site is characterised by fairly extensive stone and gravel cover with fine and sandy soil in between. The soil has very low moisture content, is shallow (between 10 cm and 60 cm) and particularly vulnerable to erosion from run-off during heavy rains.

The project site is situated at an altitude ranging between 1170 m and 1174 m above mean sea level (mamsl), sloping gentle towards the Wasser ephemeral drainage line west of the site. The overall topography slopes gently to the west.

As the medium in which vegetation grows and various vertebrates and invertebrates exist, soils are an important component of ecosystem functionality as the foundation of habitat and a facilitator of nutrient cycles, which should accordingly be protected.

Operational activities of a project of this nature (i.e. PV power facilities) are not associated with deliberate activities that might result in soil disturbances and/or contamination, as in the case with the construction phase.

Considering the practise of retaining ground cover throughout the Project site, apart from the entrance road to the Site Office, very little soil disturbance is evident as part of the operational phase.

Extensive removal of ground cover was observed during the site inspection, which will

contribute to possible soil disturbance (i.e. erosion) during rains. This impact will however be limited to the area that has been cleared of vegetation. **Based on the mentioned and on-site observations, this potential impact is flagged as ‘yellow’** for the directly disturbed area, but considering the extent in relation to the larger site; the impact is rated as ‘green’. Total clearance of ground cover should not be done, but rather retained to prevent soil disturbance (i.e. erosion). It is important that the Site Manager provide proper training and guidance to the responsible personnel on how ground cover should be kept under control as to not have an impact on operations. The particular area should be subject to part 2 of the methods as presented in the Soil Conservation and Rehabilitation Programme (*section 8.5.1 of the EMP*).

Activities during the operational phase having a potential contamination impact are the wastewater originating from the Site office’s kitchen and ablutions, as well as oil leakage from transformers. The wastewater septic tank and operational transformers were found in order without any traces of spillage. **Based on the above and on-site observations this potential impact is rated as ‘green’.**

2.2.7 BIODIVERSITY (*section 8.4.6 & 8.4.7 of EMP*) & HABITAT SENSITIVITY

Objective	To prevent unnecessary disturbance of biodiversity & habitat.	<i>Compliance</i>
Goal	To ensure ecosystem functionality is not lost.	
Tasks	Manage on-site activities so as to not result in soil disturbance, i.e. avoid total clearance of ground vegetation cover.	<i>N</i>
	Rehabilitate areas of no vegetation cover.	<i>N</i>
	Manage on-site activities so as to not result in soil pollution.	<i>Y</i>
	Fire prevention.	<i>Y</i>
	Environmental awareness training for all project staff	<i>Y</i>
Actions Required	Areas having no natural ground vegetation cover should be rehabilitated as per part 2 of the Soil Conservation and Rehabilitation Programme.	
	Train responsible personnel on how to keep vegetation growth under control without removing vegetation from the ground.	

Overall, there is a varied assemblage of plant communities within the Nama Karoo biome, including shrubby vegetation and grasslands. Vegetation at the Project site is tall shrubs with a relatively high grass cover. Fauna of concern at the Project site that might be affected during the operational phase are reptiles (i.e. snakes and scorpions) and the Cape ground squirrel.

The environmental study of December 2015 concluded that the vegetation within and surrounding the proposed project site has been severely impacted upon by grazing activities and that the proposed Project would not have a detrimental effect. The effected habitat is of low conservation importance and is not expected to be endemic to endangered species.

The environmental study of December 2015 list unnecessary disturbance to habitats that holds a negative consequence as vegetation clearance, indiscriminate waste disposal and other pollution sources, off-road driving, the spread of invasive plant species and fires.

Based on the on-site observations, natural revegetation of the site with local and indigenous shrubs and grasses has been partially successful, which is beneficial to local biodiversity recovery. However, large areas having no natural vegetation ground cover was observed, which has an unnecessary disturbance to habitat. Apart from the areas of literally no vegetation ground cover, none of the other effects (i.e. indiscriminate waste disposal and other pollution sources, off-road driving and the spread of invasive plant species) was observed during the on-site inspection.

Fires or the possible occurrence of fires are not associated with the operational phase of the Project and accordingly not expected to have any effect. The greatest cause of on-site fires exists with the explosion of transformers and/or inverters, hence the required total vegetation clearance and stone cover surface surrounding these equipment. The potential occurrence of fires is considered low as natural vegetation on site is kept under control and a firefighting trailer is available and ready.

Total clearance of ground cover should not be done, but rather retained to prevent soil disturbance (i.e. erosion). It is important that the Site Manager provide proper training and guidance to the responsible personnel on how ground cover should be kept under control as to not have an impact on operations.

Some evidence of erosion was observed on-site, although minor. No evidence of any contamination was observed. It is important to note that given the low and even no ground vegetation cover in some areas, more severe disturbance (i.e. erosion) can be expected during thunder storms, which is expected during the months of December to March, which would follow the visit of 2 November 2021.

Based on the above and the on-site observations this potential impact remains 'green', but is expected to change to 'yellow' should thunder storms be experienced.

2.2.8 WATER DEMAND (section 8.4.8 of EMP) AND CONTAMINATION

Objective	To prevent contamination of water resources.	<i>Compliance</i>
Goal	To ensure ecosystem functionality is not lost and to operate in harmony with surrounding land users.	
Tasks	Prevent water wastage and manage water usage on-site.	Y
	Manage on-site activities so as to not result in any form of pollution.	Y
	Maintain readiness of spill response personnel and equipment.	Y
	Remediation and rehabilitation of areas affected by contamination.	N/A

	Environmental awareness training for all project staff	Y
Actions Required	None.	

No surface water features are present on the Project site; however, the minor ephemeral Wasser River (including a small farm dam) is located approximately 150 m west of the site. Underground water resources are very limited considering the soil type and underground rock formations with very few rivers, resulting in low recharge and less desirable water qualities.

The PV power facility is not associated with any activity requiring noticeable water volumes. The particular PV power facility's daily demand for water (± 166 l/day) is very low, which is trucked-in and stored on-site. **The water demand and usage for this Project has remained constant over the last 3 years, which brings this impact to being 'green' and in compliance with the EMP.**

During rainfall events, dirty runoff water, resulting from potential spills of polluting substances, could potentially wash downslope into the ephemeral Wasser River located approximately 150m west of the Project site. Contamination could also seep into the groundwater resource.

Activities during the operational phase having a potential impact on the limited water resources are the wastewater originating from the Site office's kitchen and ablutions, as well as oil leakage from transformers. Although the operational phase present more long term risks, limited amounts of hazardous substances is required for maintenance and repairs, and sanitation demand will be low due to the low staffing requirement of this phase. The wastewater septic tank and operational transformers were found in order without any traces of spillage.

With no domestic or livestock watering boreholes located in proximity to the Project site, and considering the both the limited volumes of polluting substances to be used and handled on site, as well as the low rainfall of the area, infiltration of contamination into the groundwater resource and on-site observations **this potential impact is rated as 'green' and in compliance with the EMP.**

2.2.9 NOISE (section 8.4.9 of EMP)

Objective	To prevent noise disturbance to surrounding land users.	Compliance
Goal	To operate in harmony with surrounding land users.	
Tasks	Ensuring that all project vehicles and diesel powered equipment are well maintained and fitted with working silencers.	Y
Actions Required	None	

The ambient noise levels in the area are typical of a sparsely populated rural area. Potential noise receptors are limited to staff at the adjacent NamPower Kokerboom Substation and residents in scattered farm dwellings (the nearest located approximately 4.5 km south of the site), as well as tourists associated with the Quiver Tree Forest and Giant’s Playground, situated about 7.6 km to the south west.

PV power facilities do not generate noise of any significance. Potential sources of noise during the operational phase results from the inverters and transformers, and if the back-up generator is powered-up, which noise levels remains insignificant at a distance of 200m away from the source. Vehicle movement on the M29 gravel road is another source of potential noise, but considered insignificant.

Due to the industrial nature of the neighbouring NamPower Kokerboom Substation, associated staff are not considered sensitive receptors, and whilst tourists and farm residents are sensitive to noise disturbance, those located on the Weissrand plateau are located 12 km and further from the site, and those located downslope of the plateau are shielded by the local topography.

Given the low level of noise generated at the Project site, other power generation facilities close by and the distance to the closest receptor, this impact is rated as ‘green’ for both the on-site staff surrounding receptors.

2.2.10 LAND USE AND CHANGE (section 8.4.10 of EMP)

Objective	To ensure surrounding land uses are not impinged.	Compliance
Goal	To operate in harmony with surrounding land users.	
Tasks	Activities to keep within the boundary of the Project site.	Y
	Project remains that of PV power facility.	Y
Actions Required	None	

The land use in the surrounding area is typical of a rural area in relatively close proximity to an urban centre (21km from Keetmanshoop, the administrative capital of the //Karas Region), with land use activities comprising livestock and game farming, and infrastructure being limited to farming structures and bulk service infrastructure. Other land uses present are the Quiver Tree Resort, associated with the Mesosaurus fossils, Giant’s Playground dolomitic features and the Quiver Trees Forest.

The environmental study of December 2015 concluded that, the Project site represents a comparatively small portion of the current landowner’s farming activities and will have a negligible impact on the farm capacity and related socio-economic benefit. Direct impacts on land use within the Project site and immediate surroundings are unlikely and not considered significant.

As the Project’s site has remained the same without any encroachment on neighbouring land and the activity remains that of PV power generation, there has been no change in the neighbouring land use as a result of the Project. **This activity’s impact remains ‘green’ and is in compliance with the EMP.**

2.2.11 TRAFFIC SAFETY (section 8.4.11 of EMP)

Objective	To ensure road service levels and safety.	<i>Compliance</i>
Goal	To operate in harmony with surrounding land users.	
Tasks	Ensure visibility of entrance road of the M29.	Y
	Approved access remains only access.	Y
	Project driver awareness training.	Y
Actions Required	None	

The Project site is located adjacent north-west to the existing M29 gravel road, from which access is obtained, as approved by the Roads Authority.

With only 8 operational staff, limited external service requirements (periodic delivery of consumables and collection of waste) and no abnormal loads during the operational phase, additional and higher risk traffic onto the M29 is very low.

The Project site’s access of the M29 is clearly demarcated and visible, mitigating possible accidents. The limited volume of project traffic and the high service level of the roads indicate that direct impacts on the road service levels will be negligible. No other access of the M29 is obtained.

Based on the above and the on-site observations this impact is accordingly rated as ‘green’ and in compliance with the EMP.

2.2.12 AVIATION SAFETY (section 8.4.12 of EMP)

Objective	To ensure third party safety.	<i>Compliance</i>
Goal	To operate in harmony with surrounding land users.	
Tasks	Incorporate anti-reflective surfacing in PV panel design.	Y
	Communication with the local aviation industry.	Y
Actions Required	<i>None</i>	

PV power facilities could result in reflective glare, which has the potential of negatively affecting the vision and performance of pilots operating in proximity to the facility.

The environmental study of December 2015 concluded that the technology inherently lends itself to prevent glare due to the non-reflective and light energy capturing nature of the PV cells. In addition, the proposed project is located over 21 km from the Keetmanshoop airport.

Since commencement of operations in December 2018, no incident of glare has been recorded and/or reported to and by the Civil Aviation Authority to GREENAM.

Accordingly, this potential impact is rated as 'green' and in compliance with the EMP.

2.2.13 LOSS OF HERITAGE RESOURCES (section 8.4.13 of EMP)

Objective	To prevent the loss of heritage resources.	<i>Compliance</i>
Goal	To operate in a culturally sustainable manner.	
Tasks	None	N/A
Actions Required	None	

The regional archaeological distribution of the area shows that the Project site lies close to the eastern margins of a relatively dense archaeological distribution. The environmental study of December 2015 stated that at the time, insufficient knowledge exists to indicate whether the Project site would be an archaeologically productive area of survey. The assessment indicated limited surface evidence in the form of mid- to late Pleistocene stone artefact scatters, with little or none of the material in primary context.

The Construction Completion investigation (January 2019) reported that no archaeological remains were discovered during the site preparation and construction phase. Since commencement of operations in December 2018 no earthworks and/or excavations were undertaken on the Project site, hence no indication of any archaeological remains discovered. Following construction completion in December 2018, no excavations and/or trenches was made on-site.

Based on the above this potential impact is rated as 'green' and in compliance with the

EMP.

2.2.14 HEALTH, SAFETY AND SECURITY

Objective	To prevent injury to staff and surrounding residents.	<i>Compliance</i>
Goal	To operate in a safe and healthy manner.	
Tasks	Up to date first aid kit at Site Office.	Y
	Trained staff member to apply basic first aid.	Y
	All areas kept neat and tidy.	Y
	Operational and up-to-date serviced fire extinguishers.	Y
	Health, safety and security awareness training for all project staff.	Y
	Maintain all safety and health signage.	Y
	Maintain security systems throughout the site.	Y
Actions Required	None	

This particular aspect, which includes all the above impacts, applies to both the on-site staff and surrounding community. An emergency situation or incident is defined as any situation where upset conditions pose an immediate risk to health, life, property or the environment.

In addition to the above listed impacts, first aid readiness for on-site incidents during daily operations is required. In order to maintain first aid readiness, various trauma response consumables is available on-site to be applied by a trained staff member (Ms. Maria).

Workshop and laydown areas are well maintained and kept neat having no possible impact to injury.

Considering the required daily operational activities, which is predominantly office bound, very little possibility exists for incidents that would require first aid application. The incident that occurred on-site (light bump against pole on-site) did not require any first aid attention, which was reported and on record. No other incidents occurred on site.

GREENAM provides training to their employees in their respective fields and regular meetings are held on various topics of which health, safety and general security have also been included. Relevant signage is prominently displayed at various strategic locations around the Project Site and workshop areas. The workforce is provided with the necessary Personal Protective Equipment (PPE).

This potential impact is accordingly listed as 'green' and in compliance with the EMP.

2.3 CONCLUSION

From the on-site monitoring inspection it can be concluded that the activities and operations are in line with GREENAM's Environmental Policy Statement, the Project Goals and Project Commitments and the Environmental Management Plan.

The Project site is well maintained and operated in excellent manner, which serves as an example operation to other projects within this sector, as well as many other projects.

2.4 AMENDMENTS / ADDITIONS TO THE EMP

No amendment or additions to the approved EMP is required.

2.5 ACTION/S REQUIRED

It is recommended that GREENAM considers decreasing the width of the entrance road from the entrance gate to the site office.

The areas totally cleared of vegetation ground cover should be rehabilitated as per part 2 of the methods as presented in the Soil Conservation and Rehabilitation Programme (*section 8.5.1 of the EMP*) and staff responsible for vegetation control should be trained not to remove vegetation ground cover from the soil, but only trim the parts that has become too tall.

Given the time of year, i.e. rainy season coming up, the areas to be revegetated should be ripped and seeded with local on-site vegetation.

APPENDIX A

SITE PHOTOS



Photo 1 – View of Project site entrance displaying information and warning signs.



Photo 2 – View of Project site security guard with visitor's register book.



Photo 3 – View of security guard house with fire extinguisher.



Photo 4 – View of site office with clearly marked signs.



Photo 5 – View of reception area within site office displaying health and safety information and first aid room.



Photo 6 – View of reception area within site office displaying health and safety information and emergency numbers.



Photo 7 – View of storeroom kept neat and tidy.

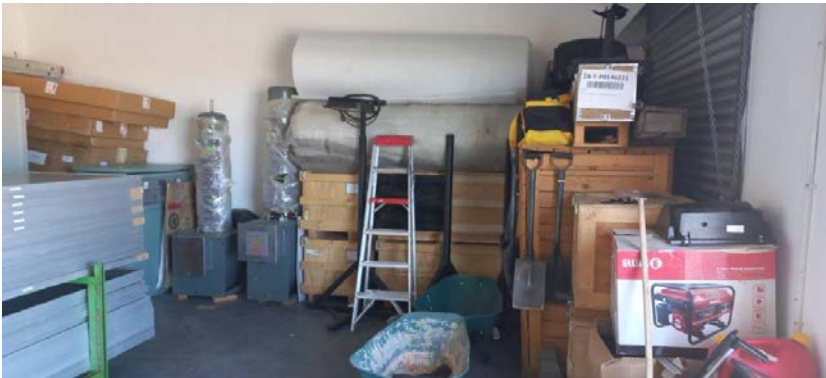


Photo 8 – View of warehouse, kept clean and tidy.



Photo 9 – View of laydown area at site warehouse, kept neat and tidy.



Photo 10 – View of fire extinguisher at site office.



Photo 11 – View of site's substation fenced-in and well maintained.



Photo 12 – View of danger sign attached to substation fence.



Photo 13 – View of entrance gate to site substation. Access is restricted and warning signs displayed on the fence.



Photo 14 – View of site's substation building with fire extinguisher.



Photo 15 – View of firefighting trailer (left) and refuel diesel trailer, both operational and in good working condition.



Photo 16 – View of back-up generator to the back of the site office's substation building with fire extinguisher.



Photo 17 – View of smoking sign indicating dedicated smoking area, close to site office. A sand bucket should be provided at the smoking sign.



Photo 18 – View of emergency gathering point, close to site office.



Photo 19 – View of site office with emergency siren.



Photo 20 – View of potable water tanks at site office.



Photo 21 – View of site fence, well maintained and intact.



Photo 22 – View of site fence with warning sign of electric fence.



Photo 23 – View of 24/7 security cameras along the Project's boundary fence.



Photo 24 – View of site inverter, well maintained and area surrounding equipment kept clean.



Photo 25 – View of PV panels with some ground cover vegetation.



Photo 26 – View of lane in between PV sections have sparse vegetation cover.



Photo 27 – View of workers loading grass that was cleared in between the PV panels.



Photo 28 – View of on-site information and records kept at the site office.