

ENVIRONMENTAL AND SOCIAL PERFORMANCE AUDIT

May 2022

HARDAP SOLAR (PV) POWER PROJECT

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ACRONYMS AND ABBREVIATIONS

Below is a list of acronyms and abbreviations used in this report:

ACRONYMS / ABBREVIATIONS	DEFINITION
Alten	Alten Solar Power (Hardap) PTY LTD
E&S	Environmental and Social
EMP	Environmental Management Plan – Prepared by Aurecon (2014)
MS	Method Statement
PV	Photo Voltaic
SLR	SLR Environmental Consulting (Namibia) (Pty) Ltd
SWPL	Sterling and Wilson

1 INTRODUCTION

Alten Solar Power (Hardap) PTY LTD (Alten) is currently operating the 37 MW Hardap Solar (Photovoltaic (PV)) power plant, near Mariental, Hardap Region. Alten has appointed SLR Environmental Consulting (Namibia) (Pty) Ltd (SLR) to conduct a renewal process for the project's Environmental Clearance Certificate. An Environmental and Social Performance Audit was conducted against the approved Environmental Management Plan – Operational Phase (EMP) as part of the submission to the Ministry of Environment, Forestry and Tourism.

Sterling and Wilson (SWPL) was appointed by Alten as the Operating Contractor for the above-mentioned project and they are responsible for all operations and management. They employ a Health, Safety and Environment Manager, who is responsible for most of the operational requirements of the EMP while statutory compliance remains with Alten.

1.1 PROJECT BACKGROUND

The Hardap Solar Power Plant is located approximately 10 km east from Mariental, along the M29. The Plant is located directly behind the NamPower Hardap Substation (see Figure 1-1). The Plant feeds approximately 37 MW into the grid during daylight hours through an overhead transmission line (approximately 200 m long) to the Hardap Substation.



FIGURE 1-1: Locality map of Alten PV Power Plant in the Hardap Region. (Google Earth has not been updated since construction of the Plant, hence an outline polygon only).

Alten approached SLR to assist with the renewal of their Environmental Clearance Certificate (expiring 18 June 2022). An audit report is required by the MEFT, as part of the renewal application, to ascertain compliance with the EMP.

2 ENVIRONMENTAL PERFORMANCE AUDIT

Robyn Christians (RC) (SLR) conducted a performance audit of the current operational activities, with specific attention to environmental and social performance, on the 10th May 2022. RC provided this report based on the site visit findings.

The objectives of this audit were to:

- Review the prepared monthly HSE reports, to provide project context and note any potential non-conformances.
- Review the EMP to provide project compliance requirements.
- Review the current waste management practices, with the emphasis on the actions being taken for the safe removal of waste.
- Review hydrocarbon management protocols and ensure compliance.
- View the current status of the project activities.
- Conduct a site inspection at the PV project site.
- Provide feedback to Alten management regarding the audit findings.
- Utilise the report as supporting documentation for renewal of the Environmental Clearance Certificate.

This entailed a detailed audit of each of the commitments contained in the relevant EMP, procedures and method statements relating to the operational activities.

2.1 METHODOLOGY AND ACTIVITIES COMPLETED DURING THE REVIEW

The following activities were conducted during the site visit:

- Meeting with SWPL Operations Manager, Ivan Smit, and HSE Manager, Mervin Lucas, to inspect the following:
 - Incident reporting procedure and register;
 - Waste removal methods and certifications;
 - Revegetation records;
 - Alien/invasive species procedure; and
 - Hazardous Materials Register and MSDS sheets.
- PV Plant site inspection included viewing the following; PV modules, inverters, waste receptacle points, hazardous material storage area, transmission lines, and back-up generator. RC was accompanied by SWPL's HSE Manager.

The below table (Table 1) is a direct copy of the Operational Framework of the Environmental Management Plan as prepared by Aurecon during the project EIA process. No changes to this table have been made by SLR. For purposes of this report the EMP Compliance column was added for the purpose of showing the audit findings.

Table 1: Environmental Management Plan Alten Hardap PV Power Plant – Operational Phase¹

NO	ASPECT	IMPACT	MITIGATION MEASURE:	PERFORMANCE INDICATOR	SUGGESTED RESPONSIBLE PARTY	SCHEDULE	EMP COMPLIANCE
1.	Environmental management documentation and procedures.	There is no framework within which to locate the management of the operational phase. No procedures against which to assess environmental performance during the operational phase and thus no measure of compliance.	<p>Objective: To ensure that the operation of the facility does not result in avoidable impacts on the environment, and that any impacts that do occur are anticipated and managed.</p> <p>Mechanism:</p> <p>1) Appoint a suitably qualified, independent ECO to monitor compliance and compile an environmental audit report.</p> <p>2) Audit the compliance against the requirements of the environmental specification contained within the OEMP.</p>	<p>Environmental impacts are effectively monitored and managed during the operational phase.</p> <p>A comprehensive record of compliance and remedial actions is available to the developer and the authorities.</p>	IPP Contractor and Project Proponent.	Audit to be undertaken twice in the first three years and then once every five years.	<p>Yes</p> <p>Due to the ECC renewal cycle, an audit will be completed every 3 years. This is beyond the commitments provided for in the EMP schedule.²</p> <p>External party is brought in once a year to conduct an environmental review as part of Alten’s due diligence requirements. This report is</p>

¹ Proposed 10MW Photovoltaic (Solar) Energy Facility near Mariental, Namibia (EMP). Aurecon (July 2014) pg. 32-37

² Proposed 10MW Photovoltaic (Solar) Energy Facility near Mariental, Namibia (EMP). Aurecon (July 2014) pg. 32

NO	ASPECT	IMPACT	MITIGATION MEASURE:	PERFORMANCE INDICATOR	SUGGESTED RESPONSIBLE PARTY	SCHEDULE	EMP COMPLIANCE
							for internal review only.
2.	Socio-economic impact.	Positive impacts on socio-economic environment during operation.	Objective: To ensure that the operation of the facility maximises positive impacts on the socio-economic environment.	Record skills and trainings, employment records and proof of staff residency in the area prior to employment.	IPP Contractor.	During the operational phase.	Yes Records are kept of staff training. Where appropriate, staff are hired locally. Professional staff are employed

NO	ASPECT	IMPACT	MITIGATION MEASURE:	PERFORMANCE INDICATOR	SUGGESTED RESPONSIBLE PARTY	SCHEDULE	EMP COMPLIANCE
							from outside the region.
3.	Protection of ecology	During the rehabilitation of vegetation during operation or during maintenance activities the site could become prone to invasion by alien species. Destruction of vertebrate fauna (e.g., road kills; fence and pylon mortalities).	<p>Objective: To prevent unnecessary disturbance to natural vegetation and fauna.</p> <p>Mechanism:</p> <p>1) Any alien plants within the site footprint must be immediately controlled to avoid establishment of a soil seed bank. Control measures must follow established norms and legal limitations in terms of the method to be used and the chemical substances used.</p> <p>2) Ensure removal and control of existing invasive alien plant species (i.e. Prosopis sp.) onsite and within the surrounding 6 m wide fire break.</p> <p>3) Maintain track discipline with maximum speed limits (e.g., 40km/h). Temporary speed humps could also be used to limit the speed at which people travel but care must be taken to ensure these do not cause erosion.</p> <p>4) Avoid off-road driving and unnecessary nocturnal driving in the area.</p> <p>5) Remove all refuse on site.</p>	<p>No alien vegetation establishment.</p> <p>No road, pylon, or electric fence mortalities.</p>	IPP Contractor	During the operational phase	<p>Yes, alien vegetation establishment is controlled, with no evidence of establishment. Mortalities are kept to a minimum through various management programmes, as mentioned below.</p> <p>An invasive species register and management plan have been established.</p> <p>A register of fauna incidents</p>

NO	ASPECT	IMPACT	MITIGATION MEASURE:	PERFORMANCE INDICATOR	SUGGESTED RESPONSIBLE PARTY	SCHEDULE	EMP COMPLIANCE
			<p>6) Maintain coils/flappers on new pylon routes longer than 100m to increase visibility and prevent further bird mortalities.</p> <p>7) If nesting on pylon structures becomes problematic, “dummy poles” could be erected for species such as sociable weaver to avoid this problem.</p> <p>8) Ensure regular maintenance of the perimeter fence and that no wildlife enters the site.</p> <p>9) Ongoing monitoring shall be undertaken to identify problems with bees, wasps, or bird species. If problems are noted, the Eskom Manual 4 should be consulted, along with an ecologist, to mitigate issues.</p> <p>10) Initiate land rehabilitation and re-vegetation as soon as possible and continue to monitor land for early signs of degradation and erosion.</p> <p>11) Re-vegetate with more palatable plant species to enable faster stocking initiation.</p> <p>12) Allow sheep (indigenous breeds - e.g., damara and gellaper) to graze and browse the site periodically during/after growth season (November-March to control vegetation in solar site instead of herbicides. Proper veld</p>				<p>established and maintained.</p> <p>Speed limits are adhered to on-site and between PV panel blocks.</p> <p>Night time driving is kept to a minimum (i.e. in emergencies only)</p> <p>The municipality provides waste management services.</p> <p>Fence, panels, overhead lines, transformers, and light masts are monitored</p>

NO	ASPECT	IMPACT	MITIGATION MEASURE:	PERFORMANCE INDICATOR	SUGGESTED RESPONSIBLE PARTY	SCHEDULE	EMP COMPLIANCE
			<p>management should be encouraged based on the rainfall, regrowth, and numbers of sheep. It is advised that the area be rested for at least two seasons after construction to allow the perennial grasses to re-establish before grazing commences. A heavy grazing regime during or after the growth season (between November and March) should keep grass short throughout.</p> <p>Should grazing be unsuccessful, or should the landowner not farm sheep, the use of herbicide could be considered and investigated by an ecologist. Application procedures should cover at least the application frequency, quantity, and type of herbicide to use.</p> <p>13) Prohibit the setting of snares (poaching) illegal collecting of veld foods (e.g., tortoises, etc.), indiscriminate killing of perceived dangerous species (e.g., snakes, etc.) and the collection of wood in and surrounding the project area.</p> <p>14) Prohibit the setting of fires as this could easily cause runaway veld fires.</p> <p>15) Do not allow domestic pets e.g., cats and dogs to accompanying employees onsite.</p> <p>16) Prevent and discourage the collection of firewood in and surrounding the project area.</p>				<p>daily to ensure no nesting.</p> <p>A garden has been established as part of revegetation campaign.</p> <p>Sheep are allowed to graze the area. Weed trimmers are used when sheep are not as effective.</p> <p>The collection of firewood is not an issue, there is no firewood in the surrounding area. Controlled access and fence patrolling is undertaken to</p>

NO	ASPECT	IMPACT	MITIGATION MEASURE:	PERFORMANCE INDICATOR	SUGGESTED RESPONSIBLE PARTY	SCHEDULE	EMP COMPLIANCE
			17) Maintain transformer covers to ensure that no owls, genet, or other animals are nesting on the transformers. 18) Ensure that solar panels are cleaned regularly and kept free of bird streamers. 19) Should baboons become problematic, the top section of the perimeter fence must be electrified to reduce the problem. 20) All pylon related vertebrate fauna problems (e.g., genet related) must be monitored on the new and existing transformers monthly. The Wildlife/ Power line incident form can be used to record data. Data shall be sent to NamPower monthly.				deter poachers.
4.	Stormwater runoff, erosion, and pollution of surface water and groundwater resources.	Contamination of stormwater runoff can impact on the surface and groundwater resources. The mismanagement of stormwater can furthermore result in erosion.	Objective: Prevent stormwater from eroding the land and becoming contaminated. Mechanism: 1) The areas likely to contribute to contaminated runoff, such as the workshop just be designed to have hardened surfaces equipped with oil and grease traps to capture any contaminated runoff. These must be maintained during operation. 2) Should storm water infrastructure be required, a management plan must be in place to ensure as a minimum that the structures are	Stormwater not contaminated by construction activities. Stormwater control measures are effective at regulating runoff from the site and erosion channels do not develop.	IPP Contractor	During the operational phase Measure water levels in the surrounding boreholes (within the 5 km radius) once a year Monthly monitoring of groundwater level fluctuations on site - submit the recorded	Not Applicable No significant surface water erosion measures are required or have been put in place around the buildings. No abstraction permit. Water

NO	ASPECT	IMPACT	MITIGATION MEASURE:	PERFORMANCE INDICATOR	SUGGESTED RESPONSIBLE PARTY	SCHEDULE	EMP COMPLIANCE
			<p>visually monitored after large rainfall events to ensure that eroded areas do not develop.</p> <p>3) Stormwater runoff from the constructed areas must be monitored to ensure that eroded areas do not develop, particularly near the outlets.</p> <p>4) Any refuse generated must be disposed of in suitable bins and removed from site at regular intervals.</p> <p>5) Maintain the groundwater table above critical groundwater levels during water abstraction periods.</p> <p>6) Ensure proper groundwater abstraction management.</p>	Groundwater water usage as per water licence		groundwater levels to MAWF for processing and evaluation.	is supplied by the municipality via a bowser. No boreholes are available for monitoring.
5.	Visual impact	The proposed site could be visible to the public and might have a negative visual impact.	<p>Objective: To reduce sunlight reflection, lights at night, and movement of maintenance vehicles.</p> <p>Mechanism:</p> <p>1) Keep access roads clear.</p> <p>2) Keep all lighting minimal, within the requirements of safety and efficiency.</p> <p>3) Where such lighting is deemed necessary use shielded low-level lighting to reduce light spillage and pollution.</p>	No complaints from the public.	IPP Contractor.	During the operational phase	A complaints mechanism has been established. 2 locked anonymous comments and complaints boxes have been placed, at a shopping complex in Mariental and

NO	ASPECT	IMPACT	MITIGATION MEASURE:	PERFORMANCE INDICATOR	SUGGESTED RESPONSIBLE PARTY	SCHEDULE	EMP COMPLIANCE
			<p>4) Avoid naked light sources that are directly visible from a distance. Only reflected light must be visible from outside the site.</p> <p>5) Rehabilitation of all impacted areas must continue until the state of the vegetation meets the requirements of the ecological assessment and is satisfactory to the Environmental Control Officer.</p>				<p>at the site entrance.</p> <p>Boxes are checked weekly.</p> <p>A complaints register is available. No complaints have been recorded.</p> <p>The Plant does not operate during night hours. The only lights are along the transmission lines.</p> <p>All light masts are angled downwards.</p>
6.	Noise impact	The increase in traffic and operation of equipment may result in noise	<p>Objective: To ensure that noise from the operational activities does not exceed unacceptable levels.</p> <p>Mechanism:</p>	No complaints from the public.	Engineer and Contractor.	During the operational phase.	No complaints from the public have been received.

NO	ASPECT	IMPACT	MITIGATION MEASURE:	PERFORMANCE INDICATOR	SUGGESTED RESPONSIBLE PARTY	SCHEDULE	EMP COMPLIANCE
		becoming a nuisance.	1) All plant, equipment and vehicles must be kept in good repair. 2) When ordering plant and machinery, manufacturers must be requested to provide details of the sound power level. Where possible, those with the lowest sound power level (most quiet) must be selected.				There is no significant noise pollution on site.

3 FINDINGS AND RECOMMENDATIONS

The section below summarises the findings from the site visit, meetings, and site inspection. A document review was conducted prior to the site visit (monthly environmental monitoring reports). A second review of documentation was conducted during the site visit, including registers, incident reports and waste records. All records were available for review and no issues detected.

3.1 KEY ISSUES FOUND DURING THE SITE INSPECTION

The following findings during the site visit are based on visual observations.

General

The auditor found the site neat and well maintained. Hazardous material and hydrocarbons are stored on an impermeable bunded surface. Access to the storage area is restricted and a spill kit is maintained adjacent to the area. A fire break is maintained along the outside perimeter. The PV modules are checked regularly for damage and cleanliness to ensure maximum electrical output.

Waste Management

Waste management was flagged as an issue during the construction phase:

- The Reusable and Recyclable Waste Management Action Plan is being implemented as evident from the ongoing waste removal activities:
 - The Municipality is contracted to remove refuse from site;
 - Recycling bins are utilised appropriately;
 - A register for the waste services available and up to date; and
 - There is no evidence of any of the remaining construction waste.
- Damaged PV panels are stored in an enclosed yard. Where appropriate parts are reused. Some panels are donated to the local community for repair and used on farms and in remote areas.

Recommendations:

- SWPL needs to continue to ensure proper housekeeping around the site and that all their workers and sub-contractors implement correct waste management practices and that these principles are regularly conveyed during toolbox talks, etc.

Ablution facilities

Findings:

- Proper ablution facilities for males and females have been established (previous construction phase finding).
- A septic tank is maintained and emptied regularly through the Municipality. The tank's surroundings are regularly inspected to ensure no discharge to the environment.

Recommendations:

- SWPL needs to continue to ensure compliance with the zero discharge requirement through continued inspection, maintenance, and emptying of tank.

Site fence

Findings:

- The fence is in good repair.
- Wind breakers have been erected to shield the PV modules.

Recommendations:

- SWPL needs to continue to maintain the fence and wind breakers.

4 CONCLUSION

RC (SLR) conducted a performance audit of the current environmental and social activities implemented on site on 10th May 2022. The focus of the audit was on the Operational Phase of the EMP.

The following activities were conducted:

- Meeting with SWPL's Operations and HSE Managers to inspect the following:
 - Registers and incident reporting practices and procedures; and
 - Implementation of management procedures.
- Site inspection (including, amongst others, waste management, hydrocarbon storage, overhead lines, PV panels and transformers).
- Meeting with HSE Manager, to provide feedback on the site inspection.
- Compile Environmental Performance review ('audit') Report (this report) following the site visit.

The auditor found significant improvement on site with regards to environmental issues since the last construction audit performed in October 2018. Once established, the site is relatively low maintenance, a total of 11 employees, including contractors, and low impact with regards to the environment.

It is important not to allow complacency and to maintain a certain level of vigilance and awareness. Daily toolbox talks should be used as a tool to ensure employees are always aware of their surroundings and potential effects of non-compliance with operating procedures.

Provided SWPL and Alten continue to implement the EMP and associated procedures, there is no reason why MEFT should not issue a renewal of the ECC.

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