

*THE PROPOSED DEVELOPMENT OF A 3.5
MEGAWATT SOLAR PHOTOVOLTAIC (PV) FACILITY
ON ERF 77, GREENBUSHES, WITHIN THE NELSON
MANDELA BAY MUNICIPALITY, EASTERN CAPE*

**ENVIRONMENTAL MANAGEMENT
PROGRAMME**

DEDEAT REFERENCE NUMBER: ECm1/C/LN1/M/28-2023



Prepared by:



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Report Details

Report Title	Environmental Management Programme, The Proposed Development of a 3.5 Megawatt Solar Photovoltaic (PV) Facility on Erf 77, Greenbushes, within the Nelson Mandela Bay Municipality, Eastern Cape Province
Report Status	Final Report
Report Date	July 2023
Purpose of this Report	<p>The Environmental Management Programme (EMPr) forms part of the Basic Assessment process for the proposed Greenbushes Erf 77 solar development, within the Nelson Mandela Bay Municipality, Eastern Cape. As per Appendix 4 of the 2014 EIA Regulations (as amended), “an EMPr must contain the information set out in Appendix 4 to these Regulations.”</p> <p>The primary objective of this EMPr is to provide mitigation, monitoring and institutional measures to be taken during the implementation and operation of the proposed development in order to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. The programme also includes the actions needed to implement these measures.</p>
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Document Checklist

The requirements for the content of the EMPr have been met in terms of Appendix 4 of the 2014 EIA Regulations (as amended). The table below indicates where the relevant information can be found within this report:

2014 EIA Regulation (Appendix 4) Information Requirement	Report Section
1 (1) An EMPr must comply with section 24N of the Act and include–	
(a) details of– (i) the EAP who prepared the EMPr; and (ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	Section 1.4.
(b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Chapter 2.
(c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Figure 2.3
(d) a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including– (i) planning and design; (ii) pre-construction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and where applicable post closure; and (v) where relevant, operation activities;	Chapter 3
(f) a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to – (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) comply with any prescribed environmental management standards or practices; (iii) comply with any applicable provisions of the Act regarding closure, where applicable; and (iv) comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable;	Chapter 4
(g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Table 4.1 and 4.2
(h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	
(i) an indication of the persons who will be responsible for the implementation of the impact management actions;	
(j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 4.3
(k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Table 4.1 and 4.2
(l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Chapter 5
(m) an environmental awareness plan describing the manner in which– (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Chapter 6
(n) any specific information that may be required by the competent authority.	Section 4.6

Table of Contents

1.	Introduction	6
1.1	Background and Project Overview.....	6
1.2	Scope of this Report.....	6
1.3	Assumptions and Limitations.....	6
1.4	The Environmental Assessment Practitioner (EAP)	6
2.	Project Description.....	7
2.1	Project Locality.....	7
2.3	Environmental Sensitivities.....	9
3.	Impact Management Outcomes	11
3.1	Summary of the Impacts Associated with the Development	11
3.2	Environmental Objectives and Targets	12
3.3	Outcomes of the Impact Management Process	12
4.	Impact Management Actions and Monitoring.....	13
4.1	Construction Environmental Management Programme	13
4.1.1	Roles and Responsibilities.....	13
4.1.2	CEMPr Documentation and Record Keeping	16
4.1.3	CEMPr Compliance.....	17
4.1.4	CEMPr Conditions and Monitoring Requirements.....	18
4.2	Operational Environmental Management Programme.....	30
4.2.1	Roles and Responsibilities.....	30
4.2.2	OEMPr Documentation and Record Keeping.....	31
4.2.3	OEMPr Compliance	31
4.2.4	OEMPr Conditions and Monitoring Requirements	32
4.3	Timing and Implementation of the CEMPr and OEMPr	38
4.4	Recommendations Included in the BAR	38
4.4.1	Pre-Construction Phase.....	38
4.4.2	Construction Phase	38
4.4.3	Operational Phase.....	38
4.5	Recommendations Included in the Specialist Studies	39
4.5.1	Terrestrial Biodiversity Specialist.....	39
4.5.2	Aquatic Specialist	39
4.5.3	Agricultural Specialist.....	39
4.5.4	Visual Specialist.....	39
4.5.5	Archaeological Specialist.....	40
4.5.6	Paleontological Specialist.....	40
4.6	Specific Requirements/Recommendations from the Competent Authority	40
5.	Environmental Compliance Reporting.....	41
6.	Environmental Awareness Plan	42

List of Tables

Table 3.1: Summary of the impacts and their significance before and after mitigation.....	11
Table 4.1: Environmental management conditions and monitoring requirements for the construction phase of the proposed development.	19
Table 4.2: Environmental management conditions and monitoring requirements for the operational phase of the proposed development..	33
Table 5.1: Compliance reporting to be undertaken for the proposed development.....	41

List of Figures

Figure 2.1: Locality map of the proposed solar PV development on Erf 77, Greenbushes, within the Nelson Mandela Bay Municipality, Easter Cape.	7
Figure 2.2: Proposed site layout.	8
Figure 2.3: Detailed layout of the proposed buildings, substation etc.....	9
Figure 2.4: Environmental sensitivity map of the project area.	10

1. Introduction

1.1 Background and Project Overview

Habitat Link Consulting (Pty) Ltd has been appointed by Rent-A-Store (Pty) Ltd, to apply for an Environmental Authorisation (EA) for the development of a solar photovoltaic (PV) facility in Greenbushes, within the Nelson Mandela Bay Municipality (NMBM). The proposed development requires the submission of a Basic Assessment Report (BAR) in terms of the 2014 National Environmental Management Act (NEMA) EIA Regulations (as amended).

1.2 Scope of this Report

The EMPr serves to ensure that environmental impacts associated with the particular activities are monitored, minimised and mitigated for the duration of the project. The practical management measures that should be employed to achieve monitoring and mitigation targets are detailed in the EMPr. The EMPr is meant to be a dynamic document which needs to be updated and reviewed on a regular basis so that it may be adapted to changing management styles, and to include improved impact mitigation technology as well as unforeseen environmental impacts that can occur. The EMPr must also be altered if any changes are made to the project. If such changes will result in significant environmental impacts, which differ from those for which the competent authority (CA) has granted authorisation, such changes must be submitted to the CA for approval before they are implemented. The mitigation measures set out in the EMPr are not limited to those identified by the specialists as outlined in the BAR, but also include other standard environmental requirements and best practice measures applicable to the construction and operation of facilities similar in nature.

1.3 Assumptions and Limitations

This report is based on information that is currently available and, as a result, the following limitations and assumptions under which this report were compiled are implicit:

- The report is based on a project description and site layouts provided by the proponent that are likely to undergo several refinements (based on environmental and technical inputs); and
- It should be emphasised that information, as presented in this document, only has reference to the study area as indicated on the project maps. Therefore, this information cannot be applied to any other area without a detailed investigation being undertaken.

1.4 The Environmental Assessment Practitioner (EAP)

According to Appendix 4, Section 1 (1) (a), of the 2014 EIA Regulations (as amended), “an EMPr must comply with Section 24N of the Act and include—

(a) details of-

- (i) the EAP who prepared the EMPr; and
- (ii) the expertise of that EAP to prepare and EMPr, including a curriculum vitae.”

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Please refer to [Appendix G.1 of the BAR](#) for the CV of the EAP.

2. Project Description

According to Appendix 4, Section 1 (1) (a), of the 2014 EIA Regulations (as amended), “an EMPr must comply with Section 24N of the Act and include—

(b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description.”

2.1 Project Locality

The development will take place on Erf 77, Greenbushes, situated approximately 15 km west of the Gqeberha (Port Elizabeth) city centre, within the NMBM, Eastern Cape Province (Figure 2.1).

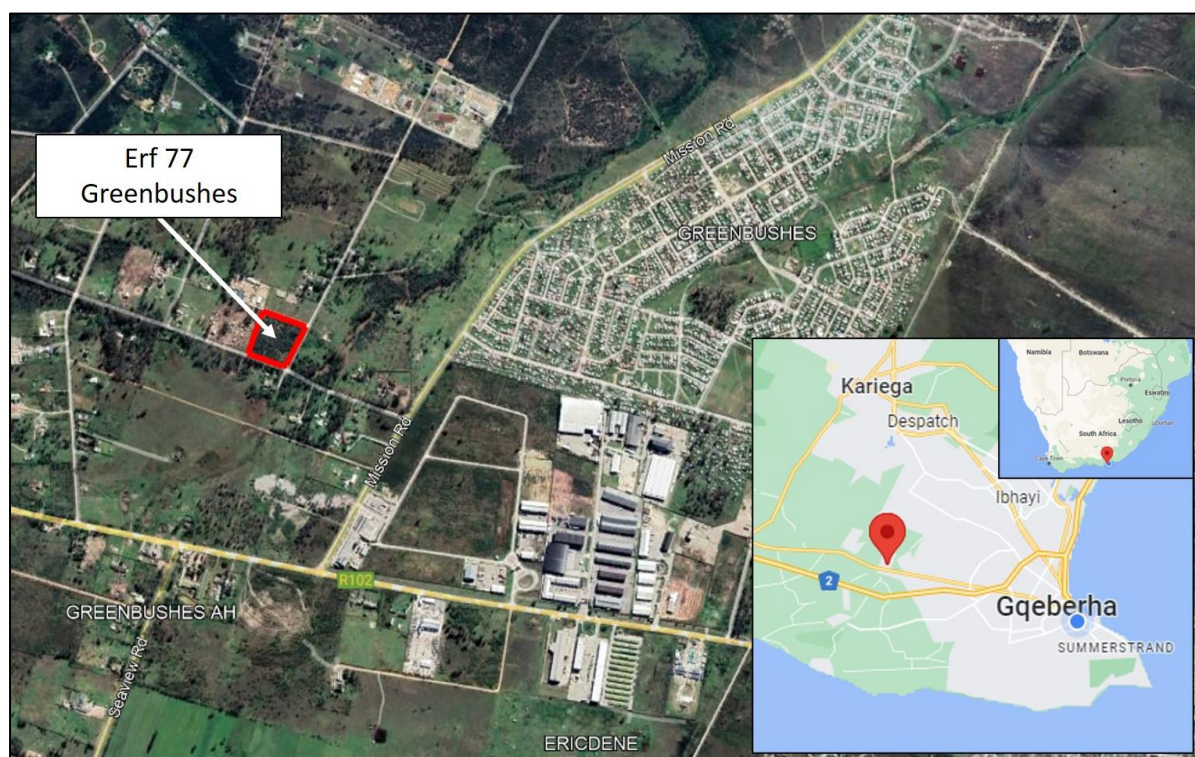


Figure 2.1: Locality map of the proposed solar PV development on Erf 77, Greenbushes, within the Nelson Mandela Bay Municipality, Easter Cape.

2.2 Detailed Project Description

The applicant, Rent-A-Store (Pty) Ltd, proposes to develop a new 3.5 megawatt (MW) solar PV facility within the 2.2 hectare (ha) property located in Greenbushes. The proposed development will include the installation of a number of solar panels to be connected to the municipal electricity grid in order to supply renewable (solar) energy.

The proposed facility will consist of approximately 4 000 solar panels that will feed renewable energy to the existing municipal electrical connection via a new municipal substation. The development will also consist of several out-buildings including ablution facilities, security control, store room, transformer/switch gear room and electrical metering room. Stormwater from the site will be diverted to a proposed pond in the south-east corner. Access to the site will be obtained off Pennelsdrift Road on the south-west corner and a new internal access road will be established along the boundary of the property. Several parking spaces will be allocated near the buildings (Figure 2.2 and Figure 2.3).

The proposed solar energy generation facility will initially produce 2.3 MW of green power (and later be upgraded to 3.5 MW), which can then be distributed to businesses in the area. This green power will allow these businesses to meet their sustainable mandates and assist with the exponential costs of electricity. This facility will also help to alleviate electrical consumption, improving grid stability and reducing load shedding.

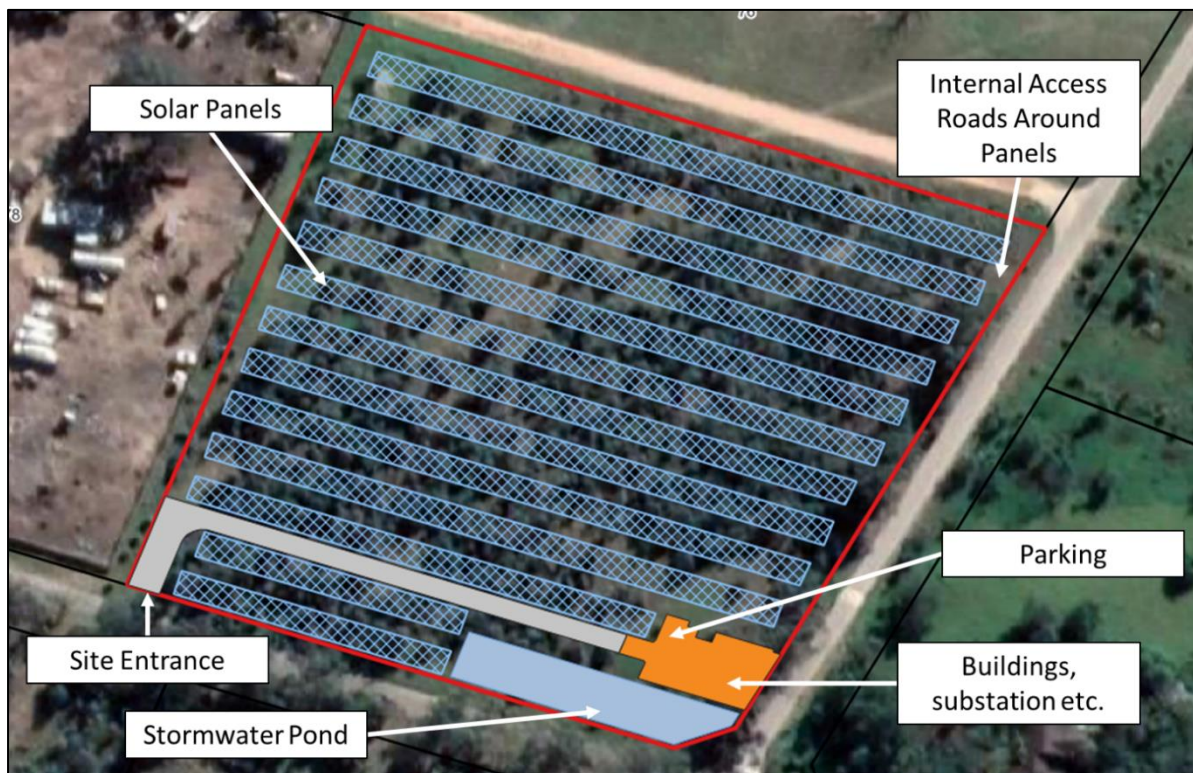


Figure 2.2: Proposed site layout.

Each row of solar panels will be fitted with two 80 kilowatt (kW) inverters, which will be connected, via cabling, to the on-site mini-substation/transformer via the electrical metering room. The mini-substation will be connected to the nearest municipal supply by either tapping into an existing 11 kilovolt (kV) or 22 kV cables by means of a Ring Main Unit, or by connecting to the nearest substation by means of an additional switch. If required, permissions for connecting to existing infrastructure via the municipal road will need to be obtained from the NMBM as well as from the adjacent landowner. For future upgrades to the 3.5 MW capacity, it is possible (although unlikely) that 33 kV underground cabling will be required for the development. The cable upgrades will occur within the footprint of any existing cabling and will not exceed 2 km in length.

While the majority of the property will consist of solar panels, the southern portion of the site has been earmarked for the development of the abovementioned associated infrastructure which include ablution facilities, security control room, store room, municipal sub-station, transformer/switch gear room and electrical metering room and parking. There is also proposed to be a 700 m² stormwater retention pond in the south-east corner of the site. It is proposed that the entire site will be fenced-off with mesh fencing, fitted with electrified fencing, in order to ensure security of the site. Further security measures will include full CCTV cameras fitted around the property boundary and at strategic points within the property. Remote off-site security monitoring will be carried out from a central control room.

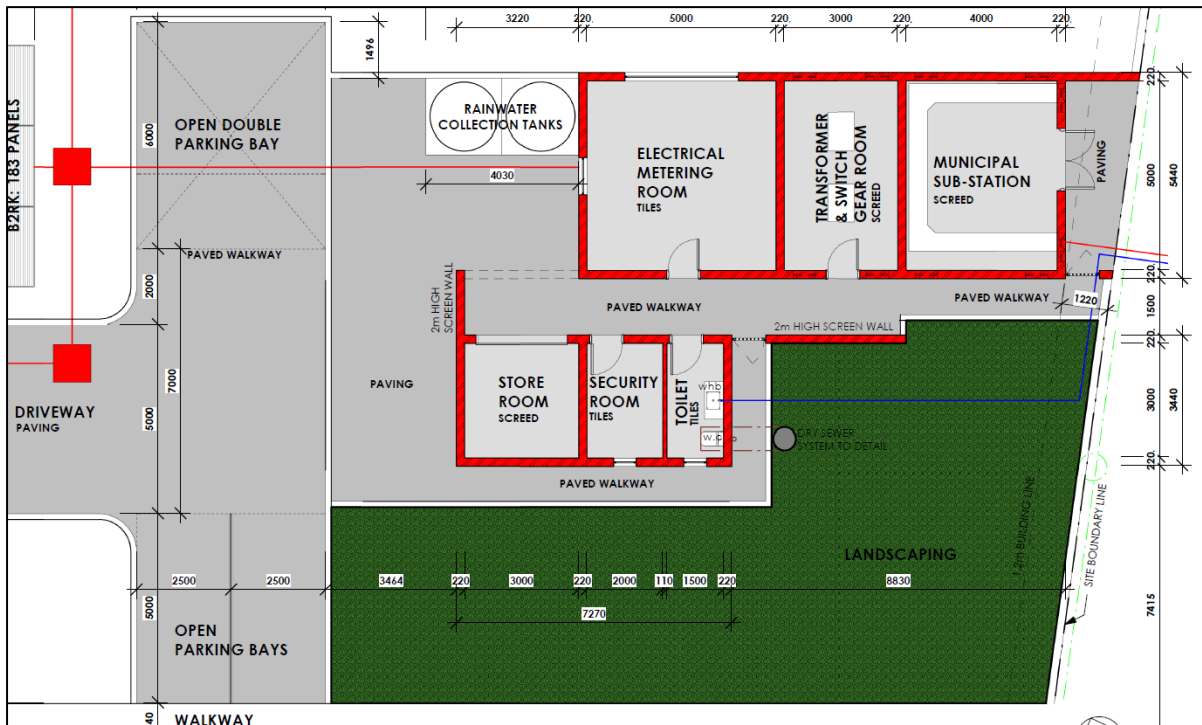


Figure 2.3: Detailed layout of the proposed buildings, substation etc.

Please refer to the detailed project description included in the Basic Assessment Report (BAR).

2.3 Environmental Sensitivities

According to Appendix 4, Section 1 (1) (a), of the 2014 EIA Regulations (as amended), “an EMPr must comply with Section 24N of the Act and include—

- (c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers.”

The south-eastern corner of the property is located within 100 m of a non-perennial tributary and the entire property is located within 500 m of a wetland, as defined by the National Freshwater Ecosystem Priority Areas (NFEPA, 2011). The nearby drainage area is classified as an ESA 1 area according to the Eastern Cape Biodiversity Conservation Plan (ECBCP, 2019) and although there is a roadway between these watercourses and the site, the topography of the site is such that surface water flows from the site would likely drain towards these nearby watercourses. The site sensitivities are therefore solely related to the nearby drainage areas and wetlands, which must be considered No-Go areas throughout the project. The property itself has no sensitive features and therefore there are no restrictions on development within the subject erf (Figure 2.4).

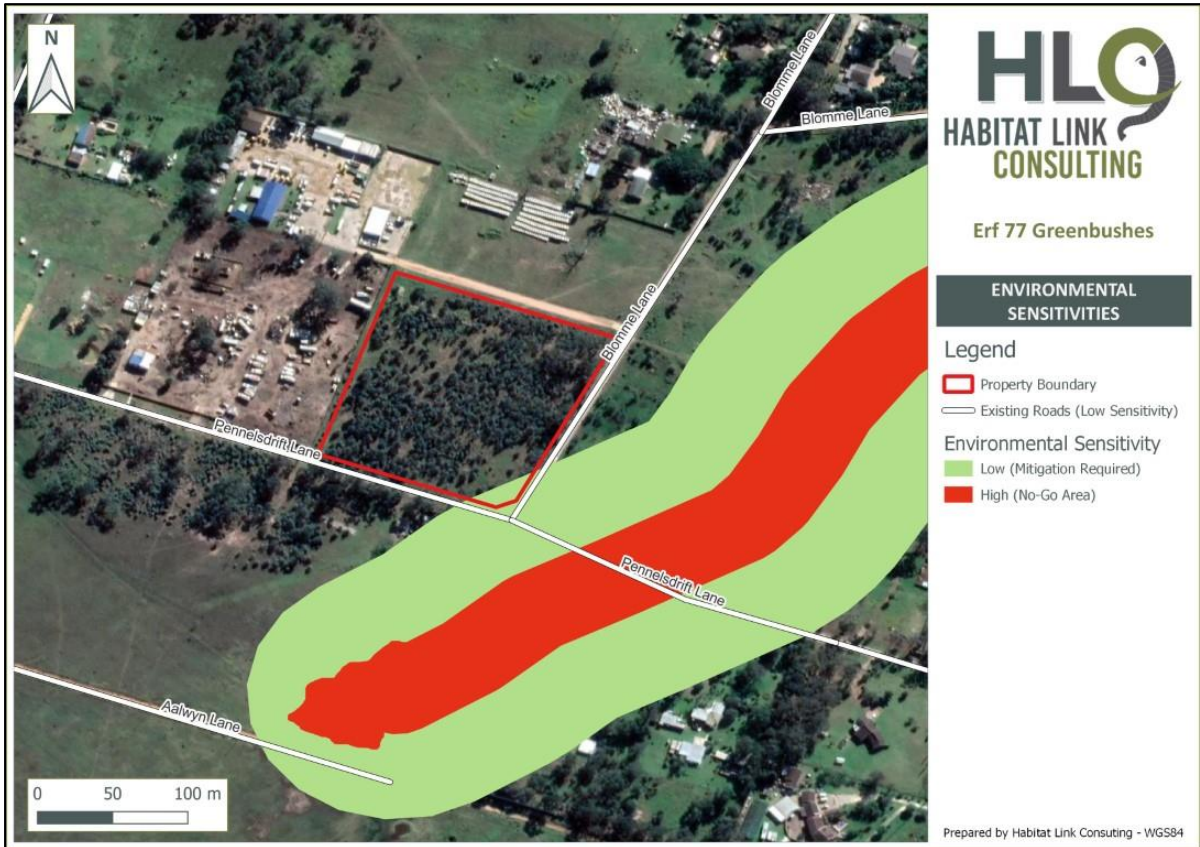


Figure 2.4: Environmental sensitivity map of the project area.

3. Impact Management Outcomes

According to Appendix 4, Section 1 (1) (a), of the 2014 EIA Regulations (as amended), “an EMPr must comply with Section 24N of the Act and include—

- (d) a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including—
- (i) planning and design;
 - (ii) pre-construction activities;
 - (iii) construction activities;
 - (iv) rehabilitation of the environment after construction and where applicable post closure; and
 - (v) where relevant, operation activities.”

3.1 Summary of the Impacts Associated with the Development

The EAP, together with the appointed specialists for this project, have identified several potential impacts on the environment that may be associated with the proposed development (Table 3.1).

Table 3.1: Summary of the impacts and their significance before and after mitigation.

IMPACT	SIGNIFICANCE (before mitigation)	SIGNIFICANCE (after mitigation)
CONSTRUCTION PHASE		
1. Direct loss of vegetation and faunal habitat	LOW –	LOW –
2. Invasion of alien vegetation	NEGLIGIBLE –	LOW +
3. Sedimentation and soil erosional impacts	LOW –	NEGLIGIBLE –
4. Pollution of surface water resources	LOW –	NEGLIGIBLE –
5. Solid Waste Pollution	LOW –	NEGLIGIBLE –
6. Dust Creation	LOW –	NEGLIGIBLE –
7. Noise Nuisance	LOW –	NEGLIGIBLE –
8. Impact on the Visual Aesthetics of the Area	LOW –	LOW –
9. Impacts on Health, Safety and Fire Risk	LOW –	NEGLIGIBLE –
10. Impact on Archaeological / Paleontological Resources	NEGLIGIBLE –	NEGLIGIBLE –
11. Construction Traffic and Road Impacts	LOW –	NEGLIGIBLE –
12. Employment Creation and Local Business Development	LOW +	MODERATE +
OPERATIONAL PHASE		
1. Invasive and Alien Species Management	LOW –	LOW +
2. Impact on Surface Water Runoff Patterns	LOW –	LOW –
3. Potential Pollution of Nearby Drainage Area	LOW –	NEGLIGIBLE –
4. Utilisation of Water	LOW –	NEGLIGIBLE –
5. Traffic Impact	LOW –	NEGLIGIBLE –
6. Noise Disturbance	NEGLIGIBLE –	NEGLIGIBLE –
7. Solid Waste Pollution	LOW –	NEGLIGIBLE –
8. Increase in Vermin and Pests	LOW –	LOW –
9. Visual Impact	HIGH –	LOW –
10. Health, Safety and Fire Risks	LOW +	LOW +
11. Provision of Renewable Electricity	HIGH +	HIGH +
12. Employment Creation and Local Business Development	LOW +	MODERATE +

3.2 Environmental Objectives and Targets

In order to meet the commitments included within the environmental specifications of this EMPr, the Proponent shall develop environmental objectives and targets to be met throughout the duration of the project. The objectives and targets must conform to, and comply with, the following criteria:

- The objectives and targets shall constitute the overall goals for environmental performance identified in the EMPr;
- When establishing objectives and targets, the Proponent shall take into account the identified environmental aspects and associated environmental impacts, as well as the relevant findings from environmental reviews and audits;
- The targets must be set to achieve objectives within a specified timeframe;
- Targets should be specific and measurable;
- When the objectives and targets are set, the Proponent must establish measurable Key Performance Indicators (KPIs). The latter will be used by the contractor as the basis for an Environmental Performance Evaluation System, and can provide information on both the environmental management and the operational systems;
- Objectives and targets need to apply broadly across the entire project, as well as to site-specific and individual activities; and
- Objectives and targets must be reviewed from time to time in view of changed operational circumstances and/or changes in environmental legal requirements, and need to take into consideration the views of the I&APs.

3.3 Outcomes of the Impact Management Process

The anticipated outcomes of the impact management process, as outlined in this EMPr, is for the environmental impacts to be mitigated as per the mitigation measures presented in the EIA process (included in this EMPr), together with the addition management measures presented herein. Should the objectives and targets listed in Section 3.2 above be achieved, the mitigation of impacts is likely to be successful and the impact management outcomes will be realised. The process by which this must be undertaken is detailed in Chapter 4 of this report.

4. Impact Management Actions and Monitoring

According to Appendix 4, Section 1 (1), of the 2014 EIA Regulations (as amended), “an EMPr must comply with Section 24N of the Act and include—

- (f) a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to —
- (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
 - (ii) comply with any prescribed environmental management standards or practices;
 - (iii) comply with any applicable provisions of the Act regarding closure, where applicable; and
 - (iv) comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable;
- (g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);
- (h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);
- (i) an indication of the persons who will be responsible for the implementation of the impact management actions;
- (j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;
- (k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f).”

4.1 Construction Environmental Management Programme

4.1.1 Roles and Responsibilities

Proponent / Licence Holder

The ultimate responsibility for the implementation of the EMPr lies with the proponent (developer). During the construction phase, responsibility for implementation may be delegated to environmental control officers, contract managers, projects managers and/or health and safety representatives.

Project Manager (PM)

The primary responsibility of the Project Manager is to ensure that the Contractor complies with the environmental specifications in this document. In addition, the Project Manager shall:

- Assume overall responsibility for the implementation and administration of the EMPr;
- Ensure that compliance with the EMPr is included as an item in the contract with the Contractor(s);
- Ensure that the EMPr is given to the applicable Construction Supervisor and the Contractor;
- In conjunction with the Construction Supervisor, undertake regular inspections of the Contractor’s site as well as the installation works, to check for compliance with the EMPr in terms of the outlined specifications as set out in this document. Inspections shall take place at least once a week and copies of the monitoring checklist contained in the file;
- Keep a register of all incidents (spills, injuries, complaints, legal transgressions etc.) and other documentation related to the EMPr;
- Implement recommendations from environmental audits;
- Ensure that construction staff is trained in accordance with requirements of the EMPr; and
- Issue penalties for incidents of non-compliance.

Consulting Engineer (CE)

The Consulting Engineer (CE) is contracted by the proponent to design and specify the project engineering aspects. Generally, the CE runs the works programme. The CE can also have a representative on site. The representative has the power/mandate to issue site instructions and, in some instances, variation orders to the Contractor, following requests by the project manager or the ECO. The CE oversees site works and liaises with the Contractor and the ECO on site.

Construction Contractor

The Contractor is responsible for the implementation of (and compliance with) the recommendations and mitigation measures contained within the EMPr, including site instructions issued by the Project Manager. The Contractor must appoint a suitably qualified and experienced Safety, Health and Environmental (SHE) Officer to assist in the implementation and monitoring of the required mitigation measures contained within the EMPr. The Contractor (and his appointed SHE Officer) shall:

- Ensure that the environmental specifications contained within this document, including revisions, additions and amendments are understood and effectively implemented. This includes the on-site implementation of the relevant steps to mitigate environmental impacts;
- Discuss implementation of (and compliance with) the EMPr document with construction staff during routine site meetings;
- Preserve the natural environment by limiting any destructive actions on site;
- Undertake daily monitoring of environmental performance and conformance with the specifications contained in this document during site inspections;
- Maintain a record of daily site checks undertaken and any non-conformances noted;
- Report progress towards implementation of (and non-conformances with) this document at site meetings with the Project Manager;
- Ensure that suitable records are kept and that the appropriate documentation is available to the Project Manager;
- Advise the Project Manager of any incidents or emergencies on site, together with a record of actions taken;
- Report and record all accidents and incidents resulting in injury or death;
- Take into consideration the legal rights of the landowner and surrounding communities;
- Ensure quality in all work done, technical and environmental; and
- Immediately resolve problems and claims arising from damage to ensure a smooth flow of construction-related operations.

Environmental Control Officer (ECO)

A suitable qualified Environmental Control Officer will be appointed by the CE and is responsible to undertake site evaluation and monitoring regarding the implementation of the EMPr. The ECO will conduct regular site visits to ensure the success of the EMPr.

The ECO will:

- Understand the contents and implications of the environmental report, and monitor the implementation of the findings using the EMPr;
- Act as a guide and consultant to the Contractor and proponent on environment related issues during construction. This will be achieved by continuous auditing of the project, identification of problem areas and provisioning of action plans in order to avoid costly stoppages and/or environmental damage;
- Compile regular site inspection reports for the inclusion in the EMPr as an addendum if necessary;

- Ensure that a ‘hotline’ exists for reporting of incidents and resolving any problems as quick as possible;
- Update the EMPr as required and inform the relevant parties of the changes that have been made;
- Keep a dated photographic record with descriptive captions of the construction site and environmental issues;
- Ensure that all complaints and concerns from the public and I&APs are addressed immediately;
- Communicate any environmental incidents to the relevant authorities;
- Ensure rehabilitation of the site is undertaken;
- Review and approve the project environmental objectives and targets;
- Assist the Contractor in finding environmentally responsible solutions to problems; and
- Issue site instructions to the Contractor for corrective actions required.

The ECO will oversee that the work carried out by the contractor is compliant with the conditions set out in the EMPr for this project and will conduct environmental audits for the duration of the construction phase.

These audits will include:

- Inspection of working sites and activities to ensure compliance with the provisions of this EMPr;
- Updating the EMPr if it is necessary;
- Remaining current with regulatory and legal requirements;
- Monitoring and auditing the project at the end of the activity in terms of the set provisions in the EA, and
- Compiling the regular compliance reports as per the requirements of the EA.

Environmental Site Officer (ESO)

The Environmental Site Officer is a representative of the proponent who is responsible for compliance throughout the duration of the project. The ESO’s duties include the following:

- Understand the recommendations and mitigation measures of the associated EMPr for the facility;
- Monitor all site activities on a regular basis for compliance;
- Conduct regular audits of the site according to the EMPr, and report findings to the proponent;
- Recommend corrective action for any environmental non-compliances noted on site; and
- Compile a monthly report highlighting any non-compliance issues as well as progress and compliance with the EMPr prescriptions.

It must be noted that the responsibility of the ESO is to monitor compliance and give advice to the proponent on the implementation of the EMPr.

Authorities

Authorities are the relevant national, provincial and/or local departments that issue licences/permits relating to environmental aspects of the project (e.g. EA, plant permits, Water Use Authorisations etc.). These Departments are responsible for ensuring that the provisions of this EMPr and the conditions of approval are complied with in terms of the relevant legislation.

4.1.2 CEMPr Documentation and Record Keeping

Method Statements

Method Statements are written submissions to the Project Manager or Consulting engineer, by the Contractor, in response to a request by the ECO, Project Manager and/or the CE. The Method Statements may comprise the way in which the plan is to be set out, materials handling and storage, the use of labour and the method that the Contractor proposes to use to carry out an activity. The Method Statement must contain the appropriate details such that the ECO and CE are able to assess whether the Contractor's proposal is in accordance with the requirements of the EMPr and good environmental and/or engineering practice. The Contractor must sign each Method Statement along with the ECO, Project Manager and/or CE in order to formalise the approval of the documents.

All Method Statements, including those which may be required as emergency decommissioning method statements, must be submitted for approval prior to the commencement of an activity. Any changes to the method of works must be reflected by amendments to the original approved Method Statement. Any changes in this regard must be approved by the ECO, CE and/or Project Manager on the understanding that such changes will be environmentally acceptable and in accordance with best engineering practice and are in line with the requirements of this EMPr.

Complaints/Incident Registers

The Contractor shall be responsible for responding to the ECO in writing with respect to queries and/or complaints relating to construction activities. The Contractor shall notify the ECO of any complaints being lodged by a third party (e.g. members of the public, registered I&APs, neighbouring land owners, etc.). The Contractor shall be responsible for maintaining a complaints register in which all complaints and corresponding actions taken are recorded. This register shall be made available to the Project Manager, CE and/or ECO/ ESO on request. The complaints register must be kept in the site office and must always be available to the ECO/ESO and/or the applicable officials. All complaints received must be investigated, and a response shall be given to the complainant within seven (7) days. The following information must be provided:

- Name, time, date, location and nature of the incident/complaint lodged;
- Date and method of letting the ECO/ESO know of such incident/complaint lodged; and
- The description of the actions taken to mitigate such incident/complaint lodged, date of such actions taken and by whom.

Emergency Preparedness Procedure

The Contractor shall ensure that there is an emergency preparedness procedure on site before commencing with activities. The Contractor must ensure that site staff are familiar with all emergency procedures to be followed and must ensure that the list of all emergency telephone numbers/contact people is kept up to date and that all numbers and names are posted at the site office at all times. The Contractor shall appoint a Safety, Health and Environmental (SHE) Officer to conduct environmental and health & safety audits at the required intervals. All environmental, health and safety incidents occurring on the site must be recorded in an environmental, health and safety incidents report. The following information, as a minimum, must be provided:

- Name, time, date, location and nature of the incident;
- The name, time and date of the person contacted to report the incident(s);
- Description of the corrective/emergency actions taken; and
- When corrective/emergency actions were taken and by whom

Record Keeping

The following is a list of documentation that must be maintained on site by the Contractor during construction and must be made available to the ECO, CE, Project Manager and to any authorities that inspect the site:

- Records of environmental induction training undertaken;
- Records of environmental toolbox talks;
- Daily site diary / instruction book;
- Copies of ECO checklist and/or audit reports;
- Records of all remediation/rehabilitation activities undertaken in response to site instructions by the ECO;
- Construction Environmental Management Programme (CEMPr);
- Environmental Authorisations and applicable licences;
- Complaints register;
- Environmental Incidences register;
- Environmental Preparedness Procedure;
- Waste disposal certificates;
- Health and Safety file and relevant documents pertaining thereto; and
- Construction method statements.

4.1.3 CEMPr Compliance

This CEMPr, and the specifications contained therein, shall form part of the Contract Documentation for the Contractor and for all Sub-Contractors. The Contractor shall help ensure that their staff members comply with the CEMPr, with the conditions of approval contained in the EA and other applicable licences/permits. In addition, the construction activities must remain compliant with any additional relevant legislation. The Contractor shall deal with acts of non-compliance, or malicious damage to the environment by any staff member. Failure to do so shall entitle the Project Manager to certify the imposition of a penalty as detailed below.

The Contractor will be considered non-compliant if:

- There is any evidence of violating the CEMPr or conditions of approval contained in the EA;
- Any environmental damage on site has occurred as a result of negligent construction activities;
- The Contractor fails to comply with any instructions issued by the ECO timeously or by the authorities within the specified timeframes; and
- The Contractor does not sufficiently or timeously respond to public complaints brought to his/her attention by the consulting engineer or the ECO.

State officials shall be allowed access to the site to assess and monitor environmental compliance at all reasonable times, and all available monitoring and auditing records shall be made available to them for inspection. In addition, copies of the Environmental Authorisation, any relevant permits/licences, and this CEMPr must be available on site at all times.

Penalties

Fines shall be issued for incidents of non-compliance at the discretion of the Project Manager. The penalties issued shall be determined in consultation with the ECO and the Proponent. Non-compliance shall be determined by means of the environmental auditing, which will be undertaken by the ECO in terms of the CEMPr. In addition to payment of the penalty, the Contractor responsible for the non-compliance incident shall also be liable for the cost of any corrective action taken to amend the environmental damage that occurred.

Suspension of Works

The Project Manager may instruct the Contractor to remove any person(s) who, in his/her opinion, is guilty of misconduct, or is incompetent, negligent, or constitutes an undesirable presence on site. Where the Project Manager deems the Contractor to be in breach of any of the requirements of this Specification, or if serious non-compliance incidents have taken place, he/she may issue a work stoppage order. The ECO may recommend suspension of works if he/she identifies major non-compliances with the conditions of the EA and/or CEMPr and/or continued minor non-compliances that are not being rectified by the construction team.

4.1.4 CEMPr Conditions and Monitoring Requirements

Environmental impacts associated with the construction phase of the development, as well as appropriate mitigation measures, have been identified using specialist input for the various components of the affected environment, along with more general construction-related impacts and accepted mitigation measures. There are a number of additional management actions that are relevant to this particular site and must be implemented throughout the construction phase.

The impact management outcomes described in Chapter 3, together with the impact management actions provided below, will undergo environmental monitoring throughout the construction phase. The monitoring method, frequency and mechanism is provided, together with the responsible person(s) assigned to the particular impact management outcome (Table 4.1)

Table 4.1: Environmental management conditions and monitoring requirements for the construction phase of the proposed development.

MANAGEMENT CATEGORY	MITIGATION/MANAGEMENT MEASURES	MONITORING METHOD	MONITORING FREQUENCY	RESPONSIBLE PERSON(S)	MONITORING MECHANISM
PRE-CONSTRUCTION CONDITIONS					
Project and Site Planning	<ul style="list-style-type: none"> • ECO to be appointed at least one (1) month prior to construction. • Final designs and layouts, as well as the final CEMPr to be approved by the ECO and CA (if required). • Construction method statements and health and safety plan to be reviewed and approved by the ECO. • All permissions/requirements in terms of the Eskom, NMBM and other servitudes must be obtained prior to commencement of construction. 	Documentation Inspections	Once-off	PM / CE / ECO / DEDEAT	Pre-Construction Audit Report
Project Design Considerations	<ul style="list-style-type: none"> • Permeable paving (or grassed pavers) should be utilised where possible to allow infiltration of stormwater. • Stormwater drainage outlets into the environment must have energy dissipating structures to reduce velocity of water and reduce potential for erosion. • Development footprints should be minimised, where possible, to reduce hardened surfaces which contribute to stormwater generation. • Make provision for water saving products such as water saving toilets with a dual-flush valve, water saving taps with spray cartridges, water-saver shower heads and timed turn-off taps. • LED lighting must be used to reduce electricity consumption. 	Documentation Inspections	Once-off	Proponent / PM / CE / ECO	
Training and Permitting Requirements	<ul style="list-style-type: none"> • EMPr and associated conditions to be signed and accepted by the Contractor. • Environmental induction training to be presented to all construction staff. • Worker health & safety and PPE requirements must be obtained and implemented prior to construction. • Relevant permits must be obtained to remove any protected species (flora and fauna). • 	Documentation Inspections	Once-off	Contractor / ECO	
Search, Rescue and Site Demarcation	<ul style="list-style-type: none"> • A walk down by a suitably qualified person should be conducted as construction is initiated in order to remove any fauna (including birds and nests) that may be disturbed during the construction process. 	Visual Inspection	Ongoing	Proponent / ECO	

MANAGEMENT CATEGORY	MITIGATION/MANAGEMENT MEASURES	MONITORING METHOD	MONITORING FREQUENCY	RESPONSIBLE PERSON(S)	MONITORING MECHANISM
Employment Creation and Local Business Development	<ul style="list-style-type: none"> • Employ local people wherever possible. • Purchase materials from local businesses wherever possible. 	Documentation Inspections	Monthly	Project Manager	Employment and purchasing figures
CONSTRUCTION CONDITIONS					
Management of Site Biodiversity					
Terrestrial Habitat Containing Species of Special Concern and Threatened Ecosystems	<ul style="list-style-type: none"> • Rehabilitation of sites disturbed by construction activities should commence as quickly after the cessation of the activities as possible. • No vegetation clearing is permitted to occur outside the development area. • Construction footprint must be limited to the approved site to minimise secondary disturbance, thus reducing the size of the areas that require revegetation to a minimum. • All plant collection from the surrounding area should be prohibited. • Clear Alien Invasive Species from areas disturbed by construction on a regular basis. • After construction activities are complete, only use indigenous plant species for rehabilitation and landscaping. • On-going removal and disposal of alien vegetation species. • Alien plant regrowth must be monitored, and any such species must be removed at regular intervals throughout the construction phase. • Only local topsoil maybe used and if any is imported, this should be certified alien plant free. • Where soils are slow to revegetate, these areas should be grubbed and planted with species suited to the region. 	Visual Inspections	Daily Monthly	Contractor / ESO ECO	Daily Checklist Audit Report
Aquatic Habitat and Water Quality	<ul style="list-style-type: none"> • All fuel storage areas, wash bays and vehicle servicing areas must be located within bunded areas with a separate dirty water handling system and oil/grease trap. It is also recommended that the wash bay water is filtered for reuse. General sediment traps should also be included where suitable. • Chemicals used for construction must be stored safely on site and surrounded by bunds. Chemical storage containers must be regularly inspected so that any leaks are detected early. • Due care to prevent accidental leakage of pollutants (e.g. oil, fuel or cement), must be of utmost priority during the construction phase. 	Visual Inspections Visual Inspection	Daily Monthly / Following any pollution event	Contractor / ESO ECO	Daily Checklist Audit Report

MANAGEMENT CATEGORY	MITIGATION/MANAGEMENT MEASURES	MONITORING METHOD	MONITORING FREQUENCY	RESPONSIBLE PERSON(S)	MONITORING MECHANISM
Fauna	<ul style="list-style-type: none"> • A walk down by a suitably qualified person should be conducted as construction is initiated in order to remove any fauna (including birds and nests) that may be disturbed during the construction process. • A No fauna encountered on site may be intentionally harmed or killed. • All personnel should be made aware of the need to protect fauna on site. • All open excavations must be barricaded or fenced. • Excavations must be checked daily for trapped fauna, and trapped animals must be rescued and released. • Injured fauna should be referred to an appropriate rehabilitation facility. 	Visual Inspections	Daily Monthly	Contractor / ESO / Proponent ECO	Daily Checklist Audit Report
Soil Erosion and Sedimentation	<ul style="list-style-type: none"> • Clearing of vegetation to only be undertaken immediately preceding commencement of construction. • Care must be taken to ensure that runoff is well dispersed so as to limit erosion. • Appropriate erosion control measures must be implemented to ensure that no erosion is taking place. At the first sign of erosion the necessary remedial action must be taken. • Temporary stabilisation measures (e.g. silt traps) should be implemented at the first signs of any erosion. • Any additional impacted areas must be rehabilitated with indigenous vegetation should construction affect areas outside of the approved footprint. 	Visual Inspections	Weekly Monthly	Contractor / ESO ECO	Weekly Checklist Audit Report
Stormwater Management	<ul style="list-style-type: none"> • Silt fences must be used where required by the ECO to remove any suspended silt from stormwater before it enters the stormwater system. • Temporary cut-off drains and berms must be used where necessary to capture stormwater and promote infiltration. • Stormwater and surface water must be diverted away from excavation trenches and other construction areas and care must be taken to avoid surface stormwater from the site running into the nearby drainage area. • No rubble, litter or sand may be deposited into any stormwater that could eventually flow into any drainage area. 	Visual Inspections	Daily Monthly	Contractor/ESO ECO	Daily Checklist Audit Report

MANAGEMENT CATEGORY	MITIGATION/MANAGEMENT MEASURES	MONITORING METHOD	MONITORING FREQUENCY	RESPONSIBLE PERSON(S)	MONITORING MECHANISM
Management of Palaeontological Heritage Resources					
Paleontological and/or Archaeological Resources	<ul style="list-style-type: none"> The Contractor and ECO responsible for the development should be alerted to the possibility of archaeological artifacts or fossil remains being found either on the surface or exposed by fresh excavations during construction. Should any heritage artefacts or fossils be discovered during construction, these should be safeguarded (preferably in situ) and the ECO should alert the Eastern Cape Provincial Heritage Resources Authority (ECPHRA. Contact details: Ms. A Mama, 74 Alexander Road, King Williams Town 5600; Email: amncwabe@gmail.com). 	Visual Inspections	Weekly	Contractor / ESO	Weekly Checklist
			Monthly	ECO	Audit Report
Management of the Site Camp and Storage Areas					
Living and Eating Areas	<ul style="list-style-type: none"> The Contractor shall not house his construction personnel on the site or in the construction camp. If no suitable eating area is available, the Contractor must provide adequate temporary shaded eating areas. Staff may not leave food or food waste anywhere where it can attract or be accessible to animals, as scavenging may cause problems and food waste may attract rodents and other vermin. 	Visual Inspections	Daily	Contractor/ESO	Daily Checklist
			Monthly	ECO	Audit Report
General materials handling, use and storage	<ul style="list-style-type: none"> Storage areas must be designated, demarcated and fenced-off. Storage areas must be secure so as to minimise the risk of crime. They must also be safe from access by unauthorised persons. Fire prevention facilities must be present at all storage facilities. 	Visual Inspections	Daily	Contractor / ESO	Daily Checklist
			Monthly	ECO	Audit Report
Hazardous Materials and Fuel Storage	<ul style="list-style-type: none"> Clear signage must be placed at all storage areas containing hazardous substances / materials. The Contractor must be responsible for the training and education of all personnel on site who will be handling the hazardous material about its proper use, handling and disposal. The Contractor must ensure that information on the management of spill and accidental ingestion is kept on site. The Contractor must ensure that their staff has been provided with the appropriate protective clothing/equipment in case of spillages or accidents. Material Safety Data Sheets (MSDSs) must be readily available on site for all chemicals and hazardous substances to be used on site. Where possible, 	Visual Inspections / Documentation Inspections	Daily	Contractor / ESO	Daily Checklist
			Monthly	ECO	Audit Report

MANAGEMENT CATEGORY	MITIGATION/MANAGEMENT MEASURES	MONITORING METHOD	MONITORING FREQUENCY	RESPONSIBLE PERSON(S)	MONITORING MECHANISM
	<p>the available MSDSs should include information on ecological impacts and measures to minimise negative environmental impacts during spills.</p> <ul style="list-style-type: none"> • The provisions of the Hazardous Chemical Substances Regulations promulgated in terms of the Occupational Health and Safety Act 85 of 1993 and the SABS Code of Practice must be adhered to. This applies to solvents and other chemicals possibly used in the construction time. • Use and/or storage of materials, fuels and chemicals which could potentially leak into the ground must be controlled. • Proper facilities for the storage of oils, paints, grease, fuels, chemicals and any hazardous materials to be used must be provided to prevent the migration of spillage into the ground and groundwater. These pollution prevention measures for storage must include a ventilated, bunded containment area with a wall high enough to contain at least 110% of any stored volume. This containment area must be lockable with controlled access. • Hazardous materials may be temporarily stored on drip-trays when in use on site. • No re-fuelling of construction vehicles or maintenance activities to occur in close proximity to the drainage area near the site. • Chemicals must be mixed on an impermeable surface and provisions must be made to contain spillages or overflows into the soil. 				
Fire prevention	<ul style="list-style-type: none"> • The Contractor must ensure that the serviced fire-fighting equipment, including fire extinguishers, is available on site. Fire-fighting equipment must be available at the fuel storage area at all times. • A trained fire warden must be present on site at all times. • All vegetation that has been cleared during construction is to be removed from site or used as mulch (except for seeding alien vegetation). • Smoking is only to be permitted in a designated smoking area within the site camp. No smoking is to be permitted on the construction site. Cigarette butts must be disposed of in an appropriate waste receptacle provided at the designated smoking area. • No open fires shall be permitted on site. • The disposal of any material by burning is prohibited. 	Visual Inspections and Servicing Records	Weekly Monthly	Contractor / ESO ECO	Weekly Checklist Audit Report

MANAGEMENT CATEGORY	MITIGATION/MANAGEMENT MEASURES	MONITORING METHOD	MONITORING FREQUENCY	RESPONSIBLE PERSON(S)	MONITORING MECHANISM
	<ul style="list-style-type: none"> The Contractor must be liable for all costs incurred to tend to any fire emergencies and/or to remediate burnt areas. 				
Ablution Facilities	<ul style="list-style-type: none"> The Contractor is responsible for the erection and maintenance of adequate ablution facilities and for enforcing the use of these facilities. The ablution facilities meant for construction workers must be located on the north-western side of the property (i.e., as far as possible from the nearby drainage line) or as approved by the ECO. The Contractor is responsible for ensuring that all ablution facilities are maintained in a clean and sanitary condition. The ablution facilities shall consist of chemical toilets at a ratio of no less than 1 toilet per 15 workers and must be secured to the ground to avoid toppling over. The doors must be provided with an external and internal closing mechanism. The Contractor must ensure that any chemicals and/or waste from the toilets are not spilled on the ground. The Contractor shall be required to remove any accumulations of chemicals and waste from the ablution site and dispose of such waste at an approved hazardous waste disposal site or sewage plant at his/her own expense. Abluting anywhere other than in the toilets shall not be permitted. Toilets must be emptied regularly and before any extended site shutdown or builders break. Proof of servicing and disposal must be provided to the ECO upon request. 	<p>Visual Inspections and Ablution Servicing Records</p>	<p>Weekly</p> <p>Monthly</p>	<p>Contractor / ESO</p> <p>ECO</p>	<p>Weekly Checklist</p> <p>Audit Report</p>
General Housekeeping	<ul style="list-style-type: none"> The site must be kept neat and clear of all litter generated by the Contractors. General and hazardous waste and construction materials must be separated and stockpiled in approved areas. Sufficient and appropriate weather- and scavenger-proof bins must be made available on site. 	<p>Visual Inspections and Waste Disposal Records</p>	<p>Daily</p> <p>Monthly</p>	<p>Contractor / ESO</p> <p>ECO</p>	<p>Daily Checklist</p> <p>Audit Report</p>
General Waste Management	<ul style="list-style-type: none"> Vegetation that is cleared from the site must be removed to a registered garden refuse site. Construction material must be reused or recycled wherever possible. General waste to be removed to a licenced landfill site on a weekly basis and records of disposal obtained. 	<p>Visual Inspections and Waste Disposal Records</p>	<p>Weekly</p> <p>Monthly</p>	<p>Contractor / ESO</p> <p>ECO</p>	<p>Weekly Checklist</p> <p>Audit Report</p>

MANAGEMENT CATEGORY	MITIGATION/MANAGEMENT MEASURES	MONITORING METHOD	MONITORING FREQUENCY	RESPONSIBLE PERSON(S)	MONITORING MECHANISM
	<ul style="list-style-type: none"> • Ensure that no refuse wastes are burnt on the premises or on surrounding premises. • Construction material must be reused or recycled wherever possible. 				
Hazardous Waste Management	<ul style="list-style-type: none"> • Any spills and leaks to be cleaned immediately and disposed of as hazardous waste at a registered hazardous waste disposal site. • Spills must be avoided during transportation of hazardous waste material. • Disposal certificates must be obtained for all hazardous waste disposals. • Staff must be trained in the identification of hazardous waste. 	Visual Inspections and Waste Disposal Records	Weekly Monthly	Contractor / ESO ECO	Weekly Checklist Audit Report
Management of the Construction Site					
Earthworks and Stockpiles	<ul style="list-style-type: none"> • All earthworks must be adequately controlled, managed and rehabilitated after use. • Limit height of stockpiles to 2 m or less. • Stockpiling outside of the property boundaries will not be permitted. • Where possible, any excavated material must be reused in construction and/or an investigation into a third party who could use the material beneficially must be undertaken to minimise waste to landfill. All unused/excess fill material must be removed from the site to a registered waste disposal site. • As far as possible, no construction material or other stock piles should be stored on the south-eastern side of the property. • Stockpiles must be monitored for erosion and mobilisation of materials. • If this is noted by an ECO, suitable cut-off drains or berms must be placed between the stockpile area and the nearby drainage line. • If stockpiles are exposed to windy conditions or heavy rain, they should be covered either by vegetation or cloth, depending on the duration of the project. Stockpiles may further be protected by the construction of berms or low brick walls around their bases. • Stockpiles must be kept clear of weeds and alien vegetation growth by regular weeding. • Stockpiles not used within three (3) months after stripping should be seeded to prevent dust and erosion, as advised by the ECO. 	Visual Inspections	Daily Monthly	Contractor / ESO ECO	Daily Checklist Audit Report

MANAGEMENT CATEGORY	MITIGATION/MANAGEMENT MEASURES	MONITORING METHOD	MONITORING FREQUENCY	RESPONSIBLE PERSON(S)	MONITORING MECHANISM
	<ul style="list-style-type: none"> Reduce the areas and stockpiles of bare soil during construction phase by using adequate covers or sowing with fast growing grasses such as kweek (<i>Cynodon dactylon</i>). 				
Topsoil	<ul style="list-style-type: none"> Stripping of topsoil will be undertaken in such a manner as to minimise erosion by wind or runoff. Topsoil will be stripped to a depth not exceeding 150 mm from the original ground level. Areas from which the topsoil is to be removed must be cleared of any foreign material which may come to form part of the topsoil during removal, including bricks, rubble, any waste material, litter, excess vegetation and any other material which could reduce the quality of the topsoil. The Contractor must ensure that subsoil and topsoil are not mixed during stripping, excavation, reinstatement and rehabilitation. Topsoil must be stockpiled in areas designated by the ECO. Stockpiled topsoil may not be compacted. 	Visual Inspections	Daily Monthly	Contractor / ESO ECO	Daily Checklist Audit Report
Cement and concrete batching	<ul style="list-style-type: none"> The cement/concrete batching area is to be located in an area away from the south-east corner of the site, as approved by the ECO. Cement/concrete batching to be undertaken on impermeable surface or ideally within bunded area. Runoff from cement/concrete mixing areas must be captured for reuse in batching or disposal as hazardous wastewater. In the event of a spill, the Contractor must take prompt action to clear polluted areas and prevent spreading of the pollutants. Water from rinsing cement off construction equipment may not be released into environment. Cement bags must be stored in a covered, bunded area and not directly on the ground. Used cement bags must be disposed of as hazardous waste, unless rinsed in water to remove excess cement dust, in which case they can be disposed of as general waste. All excess cement and concrete must be contained on the construction site prior to disposal off site. 	Visual Inspections	Daily Monthly	Contractor / ESO ECO	Daily Checklist Audit Report

MANAGEMENT CATEGORY	MITIGATION/MANAGEMENT MEASURES	MONITORING METHOD	MONITORING FREQUENCY	RESPONSIBLE PERSON(S)	MONITORING MECHANISM
Transportation of Materials and Traffic Control	<ul style="list-style-type: none"> All drivers to have the necessary driving permits to operate the plant/vehicles. All traffic laws must be obeyed at all times. Avoid transportation of construction material during peak hours. Any abnormal loads must be approved with the traffic authorities and must comply with any conditions imposed by the authorities. Avoid transportation of construction material during peak hours. The Contractor must employ flag staff in order to prevent on-site accidents. Speed must be limited to 30 km/h on site. Overloading of vehicles must not occur. Any damage to existing access roads as a result of the construction activities must be immediately repaired. Any damage to existing access roads as a result of the construction activities must be immediately repaired. Before construction commences, a photographic record of the condition of nearby roads must be documented so that necessary repairs can be made after construction activities have been completed. The Applicant will remain responsible for the implementation of any repairs required to nearby roads following completion of construction. 	Visual Inspections and Documentation Inspections	Daily Monthly	Contractor / ESO ECO	Daily Checklist Audit Report
Dust control	<ul style="list-style-type: none"> Ensure that exposed areas are dampened with non-potable water following vegetation clearance. Construction work to be halted during periods of strong wind. The loading of materials must be done with the lowest drop height and those vehicles carrying dusty materials must be securely and properly covered before they leave the site. Any complaints or claims emanating from the lack of dust control must be attended to immediately by the Contractor. Maintain vegetation as a windbreak in the area facing the prevailing wind direction until the completion of construction. 	Visual Inspections	Daily Monthly	Contractor / ESO ECO	Daily Checklist Audit Report
Visual Aesthetics	<ul style="list-style-type: none"> Good house-keeping to be implemented on site. No visually intrusive practices (e.g. night-lighting) will be allowed on site or in the surrounding areas. 	Visual Inspections	Daily Monthly	Contractor / ESO ECO	Daily Checklist Audit Report

MANAGEMENT CATEGORY	MITIGATION/MANAGEMENT MEASURES	MONITORING METHOD	MONITORING FREQUENCY	RESPONSIBLE PERSON(S)	MONITORING MECHANISM
	<ul style="list-style-type: none"> Any reflective construction material must be stored and placed in such a manner that it does not reflect sunlight towards the surrounding properties. Construction materials to be stored neatly and waste to be collected on a regular basis. Erosion, waste vegetation and dust to be mitigated as per the abovementioned mitigation measures. All disturbed areas within the property must be rehabilitated and all alien vegetation and weeds removed from these areas. 				
Odour control	<ul style="list-style-type: none"> Regular servicing of on-site toilets must be undertaken to avoid potential noxious odours. Regular servicing of vehicles and machinery in order to limit excessive gaseous emissions must be undertaken to avoid potential air pollution (servicing to be done off-site). 	Visual Inspections and Servicing Records	Weekly Monthly	Contractor / ESO ECO	Weekly Checklist Audit Report
Noise	<ul style="list-style-type: none"> Construction vehicles to be in sound working order and fitted with mufflers if necessary. The Contractor must adhere to the relevant noise regulations and limit noise to within standard working hours. As construction workers operate in a noisy environment, it must be ensured that their working conditions comply with the requirements of the Occupational Health and Safety Act (Act No 85 of 1993). Where necessary, ear protection gear must be worn. Should the vehicles or equipment not be in good working order, the Contractor may be instructed to remove the offending vehicle or machinery. Limit construction to daylight hours. Restrict unnecessary noise (e.g., portable radios, vehicle radios, whistles etc.). 	General Inspections	Daily Monthly	Contractor / ESO ECO	Daily Checklist Audit Report
CONSTRUCTION CLOSURE CONDITIONS					
Decommissioning / Demobilisation of the construction site	<ul style="list-style-type: none"> The area that previously housed the construction materials is to be checked for spills of substances such as oil, paint etc. These must be cleaned up and contaminated material disposed of as hazardous waste. 	Visual Inspections	Once-Off	Contractor / ESO	Construction Closure Report

MANAGEMENT CATEGORY	MITIGATION/MANAGEMENT MEASURES	MONITORING METHOD	MONITORING FREQUENCY	RESPONSIBLE PERSON(S)	MONITORING MECHANISM
	<ul style="list-style-type: none"> All areas that have been disturbed by construction activities should be cleared of alien vegetation. All surfaces hardened due to construction activities are to be ripped and imported materials thereon removed and disposed of off-site. All excess rubble that cannot be incorporated into construction phase is to be removed from the site to a licensed landfill site. The site is to be cleared of all litter generated by the contractors. All residual stockpiles must be removed to or spread on site as directed by the PM and or ECO. The Contractor must repair any damage that the construction works has caused to neighbouring properties (e.g. to access roads). 		Once-Off	ECO	Post-Construction Audit Report
Site rehabilitation	<ul style="list-style-type: none"> All disturbed areas shall be ripped and covered with topsoil and re-vegetated to the satisfaction of the ECO. Rehabilitation and re-vegetation of the site should be undertaken as soon as possible after construction activities have been completed. Re-vegetated areas should be watered with non-potable water until vegetation has re-established. Where soils are slow to revegetate, these areas should be grubbed and planted with species suited to the region. Disturbed areas are to be rehabilitated with indigenous species suitable to the region. All alien vegetation and weeds must be removed from the construction areas. All alien cover must be removed and then be allowed to fully recover and revegetate with indigenous plant species. These areas should remain free from alien plants and be monitored for any erosion. Where soils are slow to revegetate, these areas should be grubbed and planted with species suited to the region. 	Visual Inspections	<p>Once-Off</p> <p>Once-Off</p> <p>Ongoing</p>	<p>Contractor/ESO</p> <p>ECO</p> <p>Proponent</p>	<p>Construction Closure Report</p> <p>Post-Construction Audit Report</p> <p>Not Applicable</p>

4.2 Operational Environmental Management Programme

The period following the Construction Phase, during which the proposed development will be operational, and which will fall under the main responsibility of the Facility Manager assigned by the Proponent (Developer), will require management as per an Operational Environmental Management Programme (OEMPr).

4.2.1 Roles and Responsibilities

Proponent / Licence Holder

During the Operational Phase, the Proponent/Licence Holder will be responsible for ensuring compliance with the requirements of the OEMPr.

Engineer

An Engineer may be contracted by the Proponent to conduct inspections of the solar plant and associated infrastructure. Of utmost importance, the Engineer will be responsible for ensuring that the proposed sewer connections and stormwater infrastructure are functioning correctly, efficiently and are do not require any maintenance or upgrades. It will be the responsibility of the Engineer to advise on any maintenance requirements for these, for the solar facilities and other infrastructure within the development.

Operations / Facility Manager

The Operations Manager (facility manager), who is also a representative of the Proponent, is responsible for compliance monitoring during the Operational phase. The Operations Manager's duties include the following:

- Be familiar with the recommendations and mitigation measures of the associated OEMPr for the development;
- Monitor all site activities on a regular basis for compliance;
- Conduct regular audits of the site according to the OEMPr, and report findings to the Proponent; and
- Recommend corrective action for any environmental non-compliances noted on site.

Environmental Control Officer (ECO)

Should any specific environmental issues be raised by any party during the course of the operational phase, it may be necessary to appoint the services of a qualified ECO for external input and/or discuss the issue(s) with the relevant environmental authorities. Furthermore, an ECO will be required during maintenance work as well as to consult on the ongoing management of alien vegetation within the property. Depending on the EA, there may also be a requirement for annual audits to be undertaken by the ECO.

Authorities

Authorities are the relevant national, provincial and/or local departments that issue licences/permits relating to environmental aspects of the project (e.g., EA, plant permits, Water Use Authorisations etc.). These Departments are responsible for ensuring that the provisions of this OEMPr and the conditions of approval are complied with in terms of the relevant legislation.

4.2.2 OEMPr Documentation and Record Keeping

Complaints / Incident Registers

The Proponent or Operations Manager shall be responsible for maintaining a complaints register relating to operational activities. The Proponent or Operations Manager shall notify the ECO of any complaints being lodged by a third party (e.g., members of the public, registered I&APs, neighbouring land owners, etc.). All complaints received must be investigated, and a response shall be given to the complainant within seven (7) days.

Emergency Preparedness Procedure

The Proponent shall ensure that there is an emergency preparedness procedure on site before commencement of the operational phase. The Proponent must ensure that their staff are familiar with all emergency procedures to be followed and must ensure that the list of all emergency telephone numbers/contact people is kept up to date and that all numbers and names are available at all times. The Proponent shall instruct their Operations Manager to conduct environmental and health & safety checks on a daily basis. The Emergency Preparedness Procedure must take cognisance of, amongst others, the following potential emergencies:

- Operational fires;
- Leaks or failure of the sewage and/or stormwater reticulation and retention systems; and
- Failure of water and/or electricity supply.

Record Keeping

The following is a list of documentation that must be maintained by the Proponent throughout operation and must be made available to the ECO and to any authorities that inspect the site:

- Copies of ECO checklist and/or audit reports;
- Records of all remediation/rehabilitation activities undertaken in response to site instructions by the ECO;
- Operational Environmental Management Programme (OEMPr);
- Environmental Authorisations and applicable licences;
- Complaints register;
- Emergency Preparedness Plan;
- Operational monitoring reports, if required by the EA;
- Waste disposal certificates; and
- Environmental Preparedness Procedure.

4.2.3 OEMPr Compliance

The Proponent must ensure that their staff members comply with the OEMPr, with the conditions of approval contained in the EA and other applicable licences/permits. The Proponent shall deal with acts of non-compliance, or malicious damage to the environment by any staff member. State officials shall be allowed access to the site to assess and monitor environmental compliance at all reasonable times, and all available monitoring and auditing records shall be made available to them for inspection. In addition, copies of the Environmental Authorisation, any relevant permits/licences, and this OEMPr must be available on site at all times.

Penalties and Suspension of Works

The ECO may recommend penalties or suspension of certain operations if he/she identifies major non-compliances with the conditions of the EA and/or OEMPr and/or continued minor non-compliances that are not being rectified by the Proponent. The authorities may issue a letter of non-compliance to the Proponent and/or instruct the Proponent to cease all operations on site.

4.2.4 OEMPr Conditions and Monitoring Requirements

Environmental impacts associated with the operational phase of the development, as well as appropriate mitigation measures, have been identified using specialist input for the various components of the affected environment, along with more general operational impacts and accepted mitigation measures. There are a number of additional management actions that are relevant to this particular development and must be implemented throughout the operational phase.

The impact management outcomes described in Chapter 3, together with the impact management actions provided below, will undergo environmental monitoring throughout the operational phase and will generally be the responsibility of the Proponent and their Operations/Facility Manager. The monitoring method, frequency and mechanism is provided, together with the responsible person(s) assigned to the particular impact management outcome (Table 4.2).

Table 4.2: Environmental management conditions and monitoring requirements for the operational phase of the proposed development..

MANAGEMENT CATEGORY	MITIGATION MEASURES	MONITORING METHOD	MONITORING FREQUENCY	RESPONSIBLE PERSON(S)	MONITORING MECHANISM
Management of Site Biodiversity					
Protection of Flora and Fauna	<ul style="list-style-type: none"> Undeveloped areas within the site must remain free from alien plants and must be monitored on a regular basis. Trapping, poisoning and/or shooting of animals is strictly forbidden. Wildlife and any stray domestic animals must be cared for as per the provisions of Animal Protection Act. The use of chemicals of all forms should be carefully controlled and monitored to avoid contamination of areas frequented by animals. 	Visual Inspections	Ongoing	Proponent / Operations Manager	Operational Monitoring Reports
Protection of Aquatic Resources	<ul style="list-style-type: none"> Cleaning of solar panels must be done without the use of any chemicals or soaps. Any potential pollutant from the cleaning of panels must be diverted to a separate waste storage tank and disposed of as wastewater at an appropriate wastewater treatment facility. Limit the use of pesticides and herbicides during the operation phase in terms of alien vegetation management. Outflow from the stormwater retention pond must be managed in such a way that pollutants (e.g. litter, spills etc.) do not exit the site. The installation of litter grids as well as the provision of a spill collection sump within the retention pond are recommended. 	Visual Inspections / Water Quality Monitoring	Monthly at first, then annually	Proponent / Operations Manager	Water Quality Monitoring Reports
Alien vegetation management	<ul style="list-style-type: none"> Areas disturbed with alien plants must be actively rehabilitated with indigenous vegetation such as indigenous grass; Alien plant species must be removed on an ongoing basis; Only local topsoil may be used and if any additional topsoil is required, this should be certified alien plant free. Where soils are slow to revegetate, these areas should be grubbed and planted with species suited to the region. Limit the use of pesticides and herbicides during the operation phase, particularly with the control of AIS. 	Visual Inspections	Ongoing	Proponent / Operations Manager	Operational Monitoring Reports
Erosion and Sedimentation	<ul style="list-style-type: none"> Stormwater runoff to be managed as per the provisions of the stormwater engineer. Stormwater management structures must be monitored and maintained throughout the operational phase. 	Visual Inspections	Ongoing	Proponent / Operations Manager	Operational Monitoring Reports

MANAGEMENT CATEGORY	MITIGATION MEASURES	MONITORING METHOD	MONITORING FREQUENCY	RESPONSIBLE PERSON(S)	MONITORING MECHANISM
	<ul style="list-style-type: none"> Any servicing of equipment associated with the solar PV facility must be undertaken with due care for the environment. Any pollution from leaks or spills must be immediately cleaned and removed from the property. Should any oil leaks from vehicles be noticed, the Operations Manager must ensure that contaminated soil is dug up to 1 cm below the level of visible contamination and disposed of as hazardous waste. Where oil leaks occur on paving, absorbent material such as Spillsorb must be placed on the spill to absorb the excess oil and be disposed of as hazardous waste. 				
Management of Hospitality Areas					
Solid Waste management	<ul style="list-style-type: none"> General good house-keeping must be practiced on site and litter must be strictly controlled. Litter must be controlled by ensuring that adequate bins are made available for staff. Recycling and reusing of plastic and cardboard must be promoted to reduce the amount of waste being disposed of at the municipal transfer station. The facility management must consider obtaining the services of an external recycling company to collect recyclable waste on a regular basis. General and hazardous waste must be separated and disposed of at respective suitably licenced waste disposal sites. Any hazardous waste generated on site must be stored in an impermeable container until it can be disposed at a registered hazardous landfill site or be collected by the appropriate service provider. While transporting the waste, care should be taken as to not spill waste between the source area and the disposal site. 	Visual Inspections	Daily	Proponent / Operations Manager	Operational Monitoring Reports
Vermin and Pests	<ul style="list-style-type: none"> The waste storage area, if required, must remain closed and secured at all times in order to prevent scavengers from entering the premises. All refuse and waste must be placed in scavenger-proof bins within the waste storage area. Limited and regularised pest and rodent control measures, as per industry standard, must be utilised at strategic positions around the facility however, great care must be taken (e.g. use of poison-free rodent control). 	Visual Inspections	Daily	Proponent / Operations Manager	Operational Monitoring Reports

MANAGEMENT CATEGORY	MITIGATION MEASURES	MONITORING METHOD	MONITORING FREQUENCY	RESPONSIBLE PERSON(S)	MONITORING MECHANISM
	<ul style="list-style-type: none"> Staff must be informed of the correct waste disposal procedures. 				
Management of Surrounding Areas and Social Responsibility					
Risk of fires	<ul style="list-style-type: none"> All flammable substances must be stored in dry areas which do not pose an ignition risk to the said substances. Smoking will only be permitted in designated smoking areas. Fire extinguishers must be available and visual throughout the facility. Fire-hoses and the correct storage allowance must be made for the fire water demand as per industry standards. 	Visual Inspections / Maintenance Records	Ongoing	Proponent / Operations Manager	Operational Monitoring Reports and Maintenance Records
Conservation of local resources	<ul style="list-style-type: none"> Rainwater harvesting must be implemented to collect rainwater from the building drains and gutters. Make use of water saving products such as water saving toilets with a dual-flush valve, water saving taps with spray cartridges and timed turn-off taps. Irrigation of landscaped areas to only be undertaken with harvested rainwater or recycled water. Excessive use of water to be avoided wherever possible. Ensure that all water reticulation infrastructure is maintained regularly to avoid leaks. Monitor water consumption to ensure water usage is within any municipal drought regulations. Lights and heating elements are to be used sparingly with the aim to conserve energy, where possible. Regular maintenance and inspections of all infrastructure and services must be undertaken to ensure ongoing reliable production of renewable energy. Encourage other businesses to implement solar energy solutions wherever possible. 	Water and Electricity Readings	Monthly	Proponent / Operations Manager	Consumption Records
Traffic	<ul style="list-style-type: none"> The entrance to the facility must be positioned and managed in such a way so as to avoid backing-up of vehicles along adjacent roads. Appropriate traffic warning signs must be erected at and before the entrance to the facility. Speeding within the facility must be strictly prohibited. 	Visual Inspections	Ongoing	Proponent / Operations Manager	Complaints / Incident Registers
Noise	<ul style="list-style-type: none"> Excessively noisy vehicles to be prohibited from entering the facility. Restriction of noise-producing equipment to daylight hours where possible. 	General Inspections	Daily	Proponent / Operations Manager	Complaints / Incident Registers

MANAGEMENT CATEGORY	MITIGATION MEASURES	MONITORING METHOD	MONITORING FREQUENCY	RESPONSIBLE PERSON(S)	MONITORING MECHANISM
	<ul style="list-style-type: none"> • Any noisy electricity generation facilities should be positioned in such a way as to avoid the noise travelling to neighbouring properties (e.g. via the use of noise-damping walls or vegetation cover). • Restriction of any unnecessary noise (e.g. loud music) must be implemented throughout the facility. • General adherence to the municipal by-laws regarding noise in urban and rural areas. 				

4.3 Timing and Implementation of the CEMPr and OEMPr

The CEMPr will come into effect if the proposed development has been granted with a positive Environmental Authorisation by the Component Authority. The CEMPr will continue to be implemented throughout the construction phase and will stop as soon as all construction activities, including site rehabilitation, are completed. The OEMPr will come into effect as soon as any aspect of the development becomes operational. The implementation of the OEMPr will continue for the total duration of the development (i.e. in perpetuity or until such time as the facilities are decommissioned).

4.4 Recommendations Included in the BAR

All mitigation measures, which have been outlined in Section 4.1 and 4.2 above, must be fully adhered to. In addition, the following recommendations have been made by the EAP:

4.4.1 Pre-Construction Phase

- The Contractor is encouraged to use an already disturbed area (or area demarcated for future structures) for construction camp and material laydown purposes and must ensure that all materials required during construction are available prior to the commencement of vegetation clearance;
- Location of proposed construction camp and laydown areas must be approved by the appointed ECO before commencement;
- Environmental sensitivities outlined in this report must be demarcated as ‘no-go’ areas and no activities to be permitted within these sensitive areas (Figure 2.3).

4.4.2 Construction Phase

- Ongoing rehabilitation must be implemented in the areas which will be affected during the construction phase;
- The proponent must appoint a full-time Environmental Site Officer (ESO) to oversee the construction phase, to ensure that the construction activities remain within the designated area and that no unauthorised activities occur; and
- The appointment of an external qualified Environmental Control Officer (ECO) must take place to conduct regular construction site audits of the proposed development. It is recommended that the ECO conducts one (1) monthly site visit and submits quarterly reports to the DEDEAT, as well as one (1) report to the DEDEAT at the completion of rehabilitation.

4.4.3 Operational Phase

- Ongoing eradication of alien invasive species within the study area must be undertaken by the project proponent;
- A qualified contractor must be appointed to inspect the integrity of the buildings, sewage connections and stormwater retention pond on a minimum five (5) year basis. Should any damage be observed, or any maintenance determined necessary, this must be immediately undertaken; and
- An ECO should be present during any maintenance work.

4.5 Recommendations Included in the Specialist Studies

In addition to the mitigation measures outlined in Section 4.1 and 4.2 above, the following recommendations have been made by the specialists appointed as part of this project:

4.5.1 Terrestrial Biodiversity Specialist

1. Clear all Alien Invasive Species (AIS) from the site, and continue with AIS monitoring during the operation phase of the development.
2. Limit the use of pesticides and herbicides during the operation phase, particularly with the control of AIS.
3. Reduce the areas and stockpiles of bare soil during construction phase by using adequate covers or sowing with fast growing grasses such as kweek (*Cynodon dactylon*).
4. Utilise indigenous fynbos shrubs, grasses and trees when landscaping the site after construction phase is complete.
5. Ensure proper stormwater management by channelling flows into a stormwater pond, ensuring that it does not flow directly into any nearby watercourses.

4.5.2 Aquatic Specialist

1. A Stormwater Management Plan (SWMP) must be developed and implemented for all phases of development.
2. An ECO must monitor the site for erosion during construction.
3. An Alien Vegetation Management Plan (AVMP) must be developed and implemented for all phases of development. The number of alien vegetation on site must be reduced and the developer must ensure that alien vegetation does not spread to surrounding land.

4.5.3 Agricultural Specialist

1. As per Section 4.5.2.
2. Avoid any risk of veldfires on site. No fires will be allowed on site.

4.5.4 Visual Specialist

A number of mitigation measures can be recommended to reduce the potential visual impact and visual intrusion potential of the proposed solar PV development. The following mitigations are proposed:

Lighting

Lighting at the plant could potentially exert a visual impact, especially if floodlight-type lighting is used. The following mitigation measures should be implemented with regards to lighting:

- Lighting of the solar PV plant at night should be limited to security lighting (where this is necessary). It is acknowledged that emergency operational lighting may be required, but this should not be permanently lit.
- The height of all lights should be limited; more lights should be installed at lower heights than floodlights that would be visible from a wider area.
- All lighting should be faced downward and inward facing (towards the solar PV plant), to avoid light spilling into the surrounding areas.

Other visual mitigation measures

- As the structures supporting the panels could create cumulative glint and glare if these are metallic and reflective, the consideration of non-reflective material for the supports is recommended.
- During construction, dust suppression should be applied to avoid the creation of dust clouds to areas cleared of vegetation.

4.5.5 Archaeological Specialist

Sites and material may be covered by soil and vegetation and will only be located once this has been removed. In the unlikely event of such finds being uncovered, (during any phase of the development), it must be reported to the archaeologist at the Albany Museum in Makhanda (Grahamstown) (Tel: 046 622 2312) or to the Eastern Cape Provincial Heritage Resources Authority (Tel.: 043 745 0888) immediately. The developer must finance the costs should additional studies be required as outlined above. The consultant is responsible to forward this report to the relevant Heritage Authority for assessment, unless alternative arrangements have been made with the specialist to submit the report.

4.5.6 Paleontological Specialist

Should important new fossil remains be found the finder should alert ECPHRA (i.e. The Eastern Cape Provincial Heritage Resources Authority. Contact details: Ms. Ayanda MaMncwabe Mama 74 Alexander Road, King Williams Town 5600; amncwabe@gmail.com) as soon as possible. This is so that appropriate action can be taken in good time by a professional paleontologist at the developer's expense. Paleontological mitigation would normally involve the scientific recording and judicious sampling or collection of fossil material as well as of associated geological data (*e.g.* stratigraphy, sedimentology, taphonomy). The paleontologist concerned with mitigation work will need a valid fossil collection permit from ECPHRA and any material collected would have to be curated in an approved depository (*e.g.* museum or university collection). All paleontological specialist work should conform to international best practice for paleontological fieldwork and the study (*e.g.* data recording fossil collection and curation, final report) should adhere as far as possible to the minimum standards for Phase 2 paleontological studies recently developed by SAHRA (2013). These recommendations are summarized in tabular form (Chance Fossil Finds Procedure) and should be incorporated into the Environmental Management Program (EMPr) for the proposed development.

4.6 Specific Requirements/Recommendations from the Competent Authority

No specific recommendations have been made by the competent authority to date.

5. Environmental Compliance Reporting

According to Appendix 4, Section 1 (1), of the 2014 EIA Regulations (as amended), “an EMPr must comply with Section 24N of the Act and include—

- (l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations.”

Environmental Auditing (completion of an ECO Checklist or audit report) is the process of comparing the impacts predicted with those which have actually occurred during project implementation. An environmental audit examines and assesses practices and procedures, which, in the event of failure, would cause an environmental impact or result in an environmental risk. During each of the lifecycle phases of a development project, various issues will be monitored. The environmental audit will ensure that the environmental monitoring was correctly undertaken, and that compliance was achieved.

The ECO must compile an ECO Checklists to be distributed to all the relevant parties involved in the construction and operational phases of the project. Following this, ECO audits will be undertaken at regular intervals (either monthly or quarterly). The aim of the Environmental Audit is to:

- Review the ECO checklists for compliance with the EA and EMPr;
- Verify the recorded monitoring results on site;
- Examine and evaluate the environmental management actions in terms of achieving responsible environmental management; and
- Indicate any additional mitigation measures required for the project.

During the Construction Phase, compliance monitoring undertaken for the development must be recorded and records maintained on site. This documentation must be made available to the relevant authorities on request. While construction phase monitoring will be undertaken at regular intervals, the requirement for operational monitoring will be less stringent and, if required, will be conducted at an interval agreed upon by the environmental authorities. During the Operational Phase, compliance monitoring will continue but will be less frequent.

The overall monitoring and auditing of the site will be the responsibility of the ECO; however, the developer must provide the necessary environmental control and audit measures and integrate these through their Environmental Management Systems. The compliance reporting protocol which must be adhered to for the proposed development is included below (Table 5.1).

Table 5.1: Compliance reporting to be undertaken for the proposed development.

DEVELOPMENT PHASE	INTERNAL PROJECT REPORTING	EXTERNAL PROJECT REPORTING
Construction Phase	<p>Contractor</p> <ul style="list-style-type: none"> - Monthly reports - Method Statements <p>ESO</p> <ul style="list-style-type: none"> - Daily/weekly checklists 	<p>ECO</p> <ul style="list-style-type: none"> - Pre-Construction Audit - Monthly audit reports - Quarterly summaries to DEDEAT - Construction Closure Audit
Operational Phase	<p>Proponent:</p> <ul style="list-style-type: none"> - Monthly/annual reporting figures <p>Operations Manager:</p> <ul style="list-style-type: none"> - Daily/weekly checklists - Ongoing management 	<p>Engineer</p> <ul style="list-style-type: none"> - Maintenance inspection reports <p>ECO</p> <ul style="list-style-type: none"> - As and when required - Water quality tests (if required by DWS)

6. Environmental Awareness Plan

According to Appendix 4, Section 1 (1), of the 2014 EIA Regulations (as amended), “an EMPr must comply with Section 24N of the Act and include—

- (l) an environmental awareness plan describing the manner in which—
- (m) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and
- (n) risks must be dealt with in order to avoid pollution or the degradation of the environment.”

All construction staff on site must undergo environmental induction prior to the commencement of construction activities on site. This induction will be facilitated by the Site Manager and/or Construction Manager. No personnel will be allowed to work on site without having attended the environmental induction training. Environmental induction training must include the relevant information and requirements from the BAR, EMPr and the EA. As a minimum environmental training shall cover the following topics:

- Explanation of the specifics of this EMPr;
- Appropriate sanitation and waste disposal practices (including the separation of wastes);
- Prevention of soil and water contamination;
- Appropriate dust and noise control measures;
- Procedures to follow if any fauna or faunal habitats (e.g., nests) are encountered;
- The benefits of the implementing a “*duty of care*” for the environment;
- Employees’ roles and responsibilities, including emergency preparedness (e.g., outbreaks of fires, chemical spills etc.);
- Explanation of the need for mitigation measures that may require implementation when carrying out their activities;
- Explanation of the management structure of individuals responsible for matters pertaining to the EMPr;
- Basic site safety procedures; and
- Discussion on the potential risks to employees resulting from the work to be undertaken

The induction or training session shall describe measures that should be taken to ensure the protection of the environment (including fauna and flora, water resources, soil resources and the atmosphere). The training session may comprise a flip chart presentation with colourful posters and diagrams describing the above-mentioned issues. The information from the training session may be duplicated in hard copy handouts/brochures to be given to each member of the workforce to keep. The session shall be interactive and questions and discussion from the workforce is encouraged. It may be necessary to have a translator present at such induction or training sessions.

All senior and supervisory staff members shall familiarise themselves with the full contents of the EMPr and have an understanding the specifications herein in order to be able to assist other staff members in matters relating to the environment. Before commencing with any construction work, all new staff members shall be appropriately briefed about the EMPr and relevant occupational health and safety issues.